Prof. Dr. Stefan Razinskas
School of Business and Economics | Department of Management

Freie Universität Berlin

The Human Side of Innovation Projects

Session 1:

Course introduction & administration

No copying, photographing, video recording allowed.

© Prof. Dr. Stefan Razinskas. School of Business and Economics | Department of Management | FU Berlin. All rights reserved.

The recording and duplication of a course or its contents, e.g., slides or presentations, are prohibited for copyright and data protection reasons. Courses and contents thereof may not be distributed in whole or in part without authorization, especially not on the internet or in social networks. Insofar as personal data is processed, the relevant data protection regulations must be observed. The courses and contents are intended exclusively for educational purposes. Violations of any kind, in particular unauthorized recording of courses or contents, unauthorized use or distribution of courses or contents, violations of personal rights, illegal and improper data processing, manipulation of courses or contents, or disclosure of user IDs or passwords, will be prosecuted and punished.

To order copies or request permission to reproduce materials, e-mail stefan.razinskas@fu-berlin.de.

GENERAL NOTES ON THIS COURSE

Why It’s Good to Be Back on Campus! ☺

Source: https://www.youtube.com/watch?v=JMOOG7rWTPg&t=11s

The Rules and Etiquette of This Course

- Be on time and allow everyone to have a seat.
- Limit distractions and avoid multi-tasking, but feel free to take notes during class.
- Contribute to class, but raise your hand before joining a discussion.
- Do not discuss non-negotiable features of this course (e.g., its entirely in-person design or the dates, contents, and designs of the sessions and final exam), neither during sessions nor via e-mail.
- Respect others (i.e., their intellectual property, opinions, privacy).
- Do not record or stream any of our sessions.
- Learn more about innovation projects.
- Be open, feel trusted, and enjoy this course! ☺

Who Am I?

- Prof. Dr. Stefan Razinskas
    - Diploma in management & technology at TU Munich.
    - Doctorate in economics at WHU – Otto Beisheim School of Management.
    - Assistant professor at the Institute for Leadership and Organization (ILO) at LMU Munich.
    - Junior Professor of Management at FUB since 01/2020.
- Research interests
    - Organizational behavior during (team-based) innovation.
    - Cross-level influences of stressors and diversity in teams and small groups.
    - Methods in multi- and cross-level organizational research.
- Contact
    - E-Mail: stefan.razinskas@fu-berlin.de
    - Web: www.wiwiss.fu-berlin.de/razinskas

Research Conducted at the Junior Professorship of Management

- Key purpose
  - Making significant scientific contributions to current topics important for **leveraging the creative and motivational capabilities of employees without compromising their health**.
  - It particularly addresses multi-level problems critical for the **efficient collaboration in teams and work groups despite constantly growing challenges**.
- Main research areas
  - **Teams & collaboration**, e.g., cross-functional teamwork, inter-organizational collaboration, team diversity and demographic faultlines, collective ideation.
  - **Leadership & self-awareness**, e.g., authentic leadership and stress, charismatic leadership in digitized contexts, learning from bad leaders.
  - **Stress & resilience**, e.g., recovery from setbacks, situational constraints and creativity, professional development and the work–life interface.

Course Administration

- Language of instructions
  - English
- Course handling and learning
  - This is an on-site course that will be executed entirely in-person.
  - Each meeting consists of a lecture that is followed by a tutorial intended to provide additional and in-depth insights into the course content.
  - During each tutorial, quizzes in multiple-choice format are provided to test and apply the knowledge from the lecture.
  - Recap meetings will conclude each larger part of this course to ensure sustained learning progression of all course participants.
  - Questions, remarks, and discussions are welcome.
- Course materials and readings
  - Will be provided online via Blackboard.
  - Provided readings are mandatory.

Exam Information

- There will be two separate examination dates for exams to be written this summer term.
  - 1st exam: Tuesday, July 18th, 2023, from 4:00 to 6:00 p.m. (s.t.)
  - 2nd exam: Tuesday, August 29th, 2023, from 9:00 to 11:00 a.m. (s.t.)
- These are on-site exams that are both written in HS 101 (Garystr. 21, 14195 Berlin).
- If you are unavailable (for whatever reason) at the first examination or if you show up but fail at passing the first exam, you will be automatically signed up for the second exam.
  - No withdrawal from the first examination due to illness is required to participate in the second examination.
- The last meeting on July 11th, 2023, will wrap-up our course.
  - This meeting will contain an exam preparation.
  - It will further allow you to ask questions and clarify anything that comes up during your exam preparation.

Course Outline

1	April 18th, 2023, 2 – 6 p.m.	HS 101	Course introduction & administration
Part 1: Individual level			
2	April 25th, 2023, 2 – 6 p.m.	HS 101	The assessment of innovation capabilities
3	May 2nd, 2023, 2 – 6 p.m.	HS 101	The development of innovation capabilities
4	May 9th, 2023, 2 – 6 p.m.	HS 101	Resilience and innovation
5	May 16th, 2023, 2 – 6 p.m.	HS 101	Recap: Innovation from an individual-level perspective
Part 2: Team level			
6	May 30th, 2023, 2 – 6 p.m.	HS 101	Innovation in teams: Team processes
7	June 6th, 2023, 2 – 6 p.m.	HS 101	Innovation in teams: Team composition
8	June 13th, 2023, 2 – 6 p.m.	HS 101	Recap: Innovation from a team-level perspective
Part 3: Organizational level			
9	June 20th, 2023, 2 – 6 p.m.	HS 101	Institutionalizing innovation
10	June 27th, 2023, 2 – 6 p.m.	HS 101	Implementing innovation
11	July 4th, 2023, 2 – 6 p.m.	HS 101	Basics in project management
12	July 11th, 2023, 2 – 6 p.m.	HS 101	Course wrap-up and exam preparation

AN INTRODUCTION TO THE HUMAN SIDE OF INNOVATION PROJECTS

The Relevance of Innovation

- Growing importance due to ongoing megatrends
  - Globalization
  - Technology (increasing connectedness and digitization)
  - Demographic changes (Gen Z rising and silver society)
  - Social changes (work-life unboundedness and emerging markets)
  - Climate change (resource scarcity and decarbonization)
- Particular importance for high-income economies

  Justification of higher prices

  Barrier to imitation

  Sustainable competitive advantage

The Role of Business in Society

- Business has a large impact on society and our environment, e.g.:
  - Emissions
  - Resource depletion
  - Packaging
  - Child labor
  - Wages
  - Stimulating/Manipulating consumption by advertisement

- Business is severely impacted by societal and environmental challenges, e.g.:
  - Resource scarcity
  - Governmental regulations
  - Civil society activism

The Role of Business in Markets

- Business has also to deal with market challenges, e.g.:
  - Increased competition
  - Emerging low cost economies
  - Increasing raw material costs
  - Rapidly changing technology
  - Shortened product lifecycles
  - More sophisticated costumers
  - More demanding investors

- Only every second organization that makes it into the Fortune 500 is still in it one decade later.

Innovation Has Become the Core of Many Organizations' Visions and Values

- Most companies (and countries) emphasize the importance of innovation for growth and success.
- Some examples:

SIEMENS
Ingenuity for life

A world of proven talent where we are delivering breakthrough innovations, giving our customers a unique competitive edge, enabling societies to master their most vital challenges and creating sustainable value.

"Innovation is a cornerstone of Siemens success. (…) Our goal is to be a trendsetter in all of our businesses. ***We unlock the energy and creativity of our employees, embracing the new and different.*** *We are also ingenious and we embrace this quality in all its varied meanings - original, inventive and resourceful. (…) We constantly renew our portfolio to provide answers to societies most vital challenges, enabling us to create sustainable value."*

(Siemens AG, https://new.siemens.com/gr/en/company/about/values-and-visions.html)

AIRBUS

Customer focus, integrity, respect, creativity, reliability and teamwork. These values shape the DNA of our business, reflecting the unique blend of qualities found in every member of our global family.

"We value and encourage creativity. We recognise that ***creativity exists in many forms, with ideas brimming at every level****, from "shoot for the moon" ambitions, right down to our daily work. Creativity can often mean simply looking at things in a different way and our collaborative culture allows us to build on ideas and continually improve the work that we do. We make sure that everyone at Airbus has the time, space and tools to progress ideas with imagination and passion. We are always ready to act with courage, challenging our ideas and learning from our processes when we need to go back to the drawing board."*

(Airbus, https://www.airbus.com/company/we-are-airbus/our-values.html)

Where Good Ideas Come From

Source: https://www.youtube.com/watch?v=NugRZGDbPFU

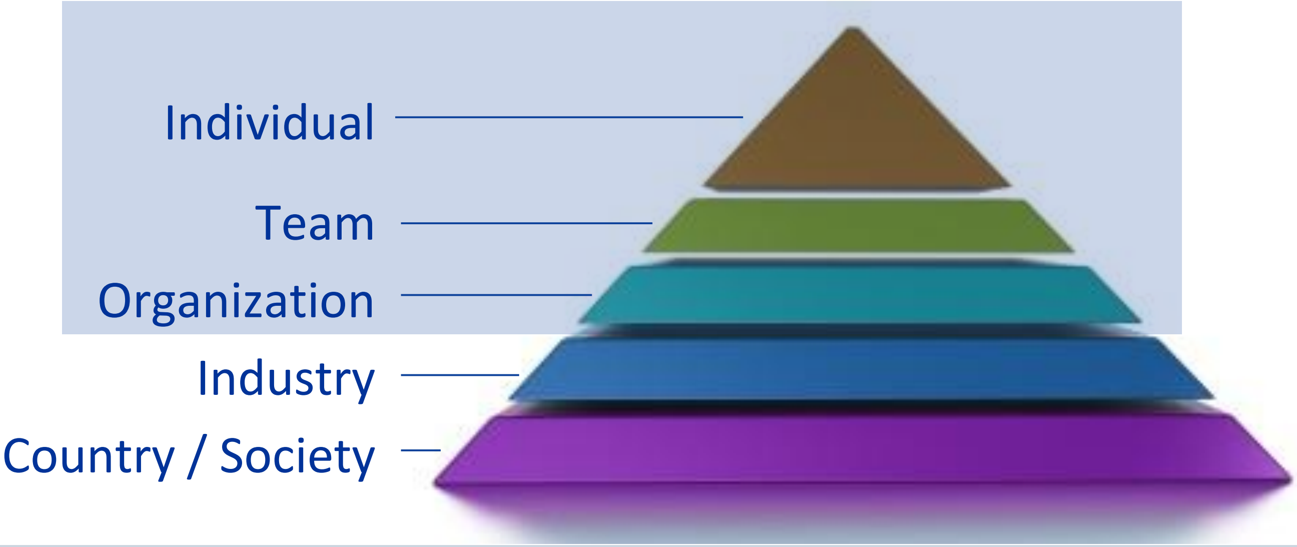
Perspectives on Innovation

- Innovation is a multi-faceted construct:
    - Strategy: E.g., technology licensing, innovation portfolio.
    - Economics: E.g., institutions and regulations.
    - Engineering: E.g., technical development of new products.
    - Marketing: E.g., market launch of new products.

➡ We focus on the people side of innovation

- How can we make the most of the people that are carrying out an organization’s innovation activities?

- Innovation is a multi-level construct



Individual

Team

Organization

Industry

Country / Society

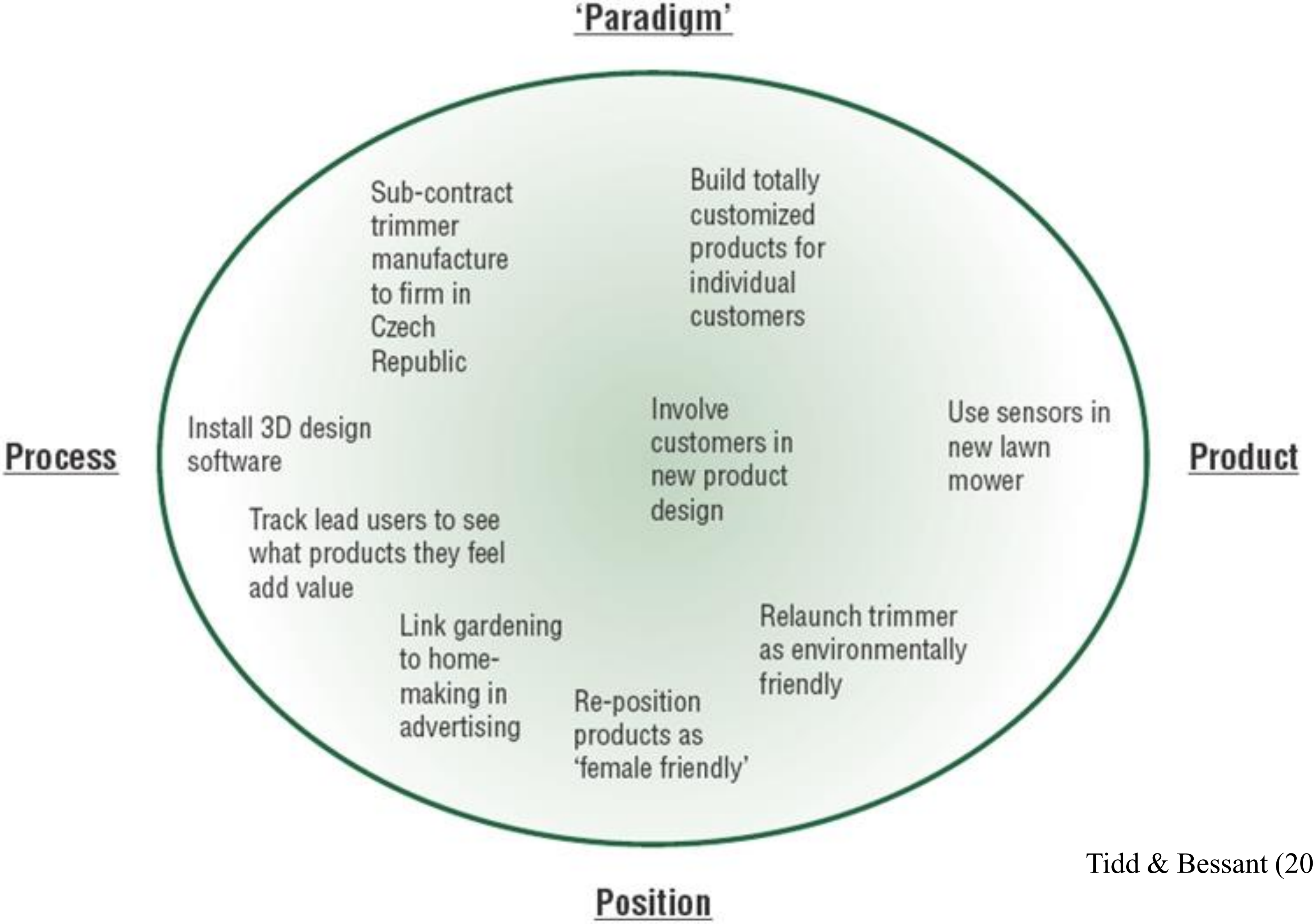
Definitions

- Innovation (Amabile, et al., 1996)
  - “The successful implementation of creative ideas within an organization.”
- Innovation ≠ Invention
  - Invention is the manifestation of a creative idea in a unique product, method, or process, however, irrespective of its implementation or success.
- Creativity (Sternberg & Lubart, 1999)
  - “Creativity is the ability to produce work that is both novel (i.e., original, unexpected) and appropriate (i.e., useful, adaptive concerning task constraints).”
- Creativity is a necessary (but not sufficient) condition for innovation.

Types of Innovation

- The degree of innovation (Hauschildt & Schlaak, 2001; Song, et al., 1998):
  - **Incremental innovation**: Do what we did before but better.
  - **Radical innovation**: Do something different.
- The consequences of innovation (Danneels, 2004; Markides, 2006):
  - **Disruptive innovation**: Disturbing prevailing consumer habits and behaviors in a major way,
  - and/or undermining the competences and assets on which existing competitors have built their success.
- The subject of innovation: The four “P”s (Tidd & Bessant, 2009):
  - **Product**: What we offer the world.
  - **Process**: How we create and deliver that offering.
  - **Position**: Where we target that offering.
  - **Paradigm**: How we frame what we do.

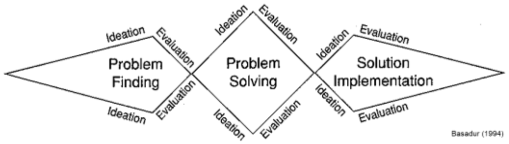
Types of Innovation


'Paradigm'
Process
Product
Position
Sub-contract trimmer manufacture to firm in Czech Republic
Build totally customized products for individual customers
Install 3D design software
Involve customers in new product design
Use sensors in new lawn mower
Track lead users to see what products they feel add value
Link gardening to home-making in advertising
Relaunch trimmer as environmentally friendly
Re-position products as 'female friendly'

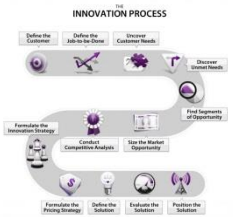
Tidd & Bessant (2009)

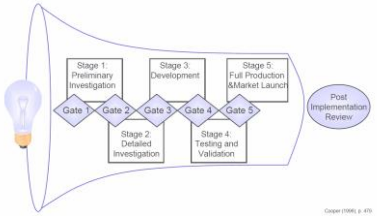
Innovation Process

- Different conceptualizations:



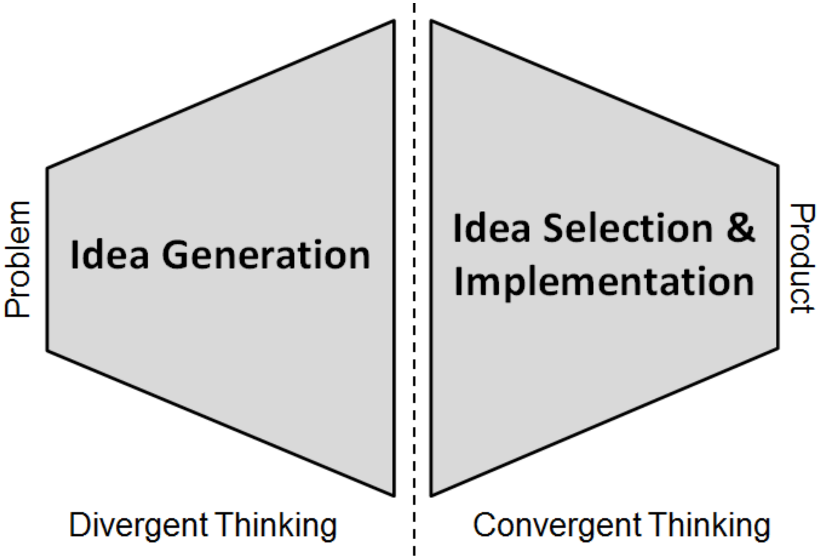
Basadur (1994)


THE INNOVATION PROCESS
Define the Customer
Define the Job-to-be-Done
Uncover Customer Needs
Discover Unmet Needs
Find Segments of Opportunity
Size the Market Opportunity
Conduct Competitive Analysis
Formulate the Innovation Strategy
Formulate the Pricing Strategy
Define the Solution
Evaluate the Solution
Position the Solution


Stage 1: Preliminary Investigation
Stage 3: Development
Stage 5: Full Production &Market Launch
Gate 1
Gate 2
Gate 3
Gate 4
Gate 5
Post Implementation Review
Stage 2: Detailed Investigation
Stage 4: Testing and Validation

Cooper (1996), p. 470

- **Basic aspects of the innovation process:**



Problem

Idea Generation

Idea Selection & Implementation

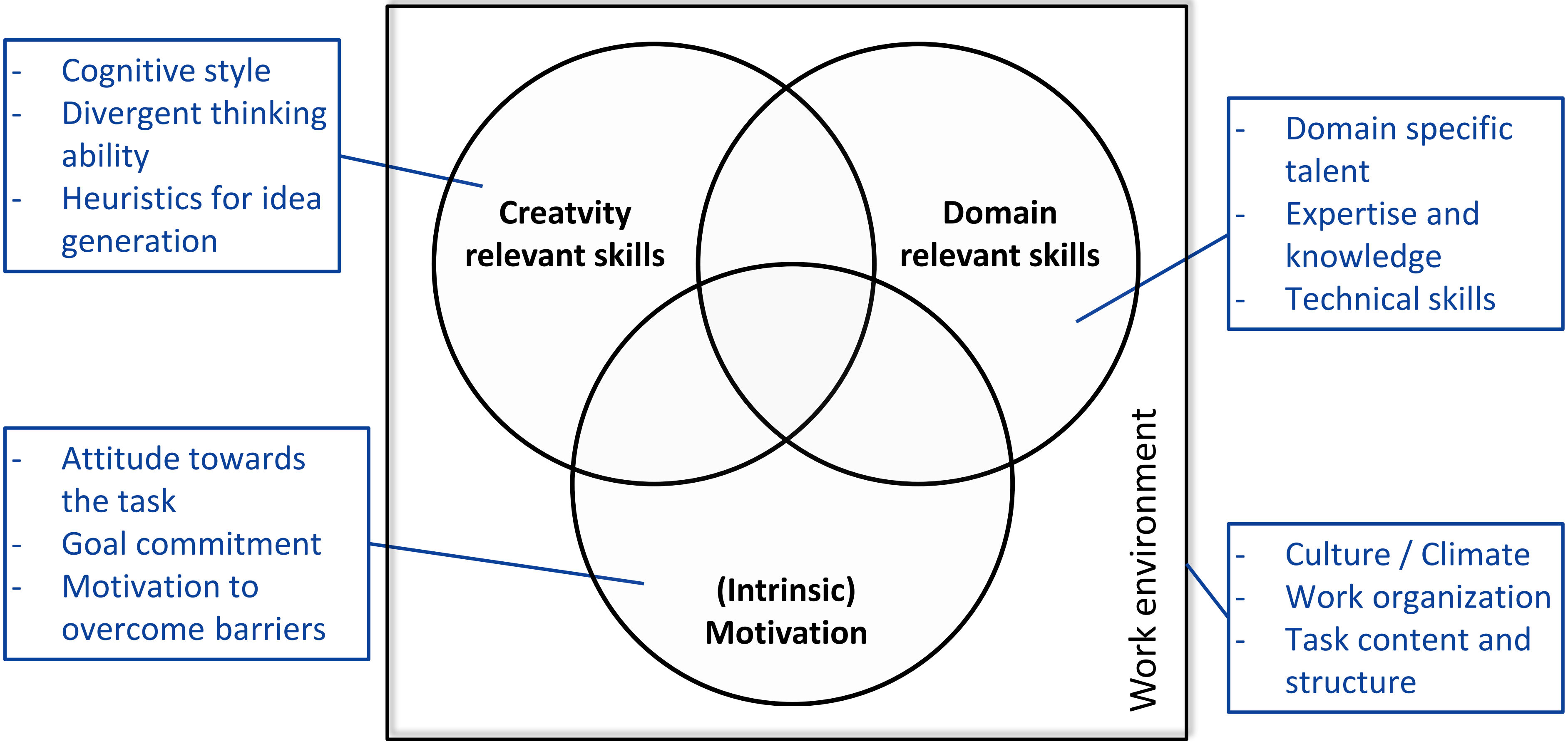
Product

Divergent Thinking

Convergent Thinking

Creativity in Organizations

- Components of creative performance by T. Amabile



- Cognitive style
- Divergent thinking ability
- Heuristics for idea generation

- Domain specific talent
- Expertise and knowledge
- Technical skills

- Attitude towards the task
- Goal commitment
- Motivation to overcome barriers

- Culture / Climate
- Work organization
- Task content and structure

Amabile (1983, 1988)

References

Amabile, T. M. 1983. The social psychology of creativity: A componential conceptualization. ***Journal of Personality and Social Psychology**, 45*(2), 357-376.

Amabile, T. M. 1988. A model of creativity and innovation in organizations. In B. M. Staw, & L. L. Cummings (Eds.), ***Research in organizational behavior***, Vol. 10: 123-167. Greenwich, CT, U.S.: JAI Press.

Amabile, T. M., Conti, R., Coon, H., Lazenby, J., & Herron, M. 1996. Assessing the work environment for creativity. ***Academy of Management Journal**, 39*(5), 1154-1184.

Basadur, M. 1994. Managing the creative process in organizations. In M. A. Runco (Ed.), ***Creativity research. Problem finding, problem solving, and creativity***: 237-268. Westport, CT, U.S.: Ablex Publishing.

Cooper, R. G. 1996. Overhauling the new product process. ***Industrial Marketing Management***, 25(6): 465-482.

Danneels, E. 2004. Disruptive technology reconsidered: A critique and research agenda. ***Journal of Product Innovation Management***, 21(4): 246-258.

Hauschildt, J., & Schlaak, T. 2001. Zur Messung des Innovationsgrades neuartiger Produkte. ***Zeitschrift für Betriebswirtschaft***, 71(2): 161-182.

Markides, C. 2006. Disruptive innovation: In need of better theory. ***Journal of Product Innovation Management***, 23(1): 19-25.

Song, X. M., & Montoya-Weiss, M. M. 1998. Critical development activities for really new versus incremental products. ***Journal of Product Innovation Management***, 15(2): 124-135.

Sternberg, R. J., & Lubart, T. I. 1999. The concept of creativity: Prospects and paradigms. In R. J. Sternberg (Ed.), ***Handbook of creativity***: 3-15. New York, NY, U.S.: Cambridge University Press.

Tidd, J., & Bessant, J. 2009. ***Managing innovation: Integrating technological, market and organizational change*** (4th ed.). Chichester, U.K.: John Wiley & Sons Ltd.

Prof. Dr. Stefan Razinskas
School of Business and Economics | Department of Management

The Human Side of Innovation Projects

Session 2:

The assessment of innovation capabilities

No copying, photographing, video recording allowed.

© Prof. Dr. Stefan Razinskas. School of Business and Economics | Department of Management | FU Berlin. All rights reserved.

The recording and duplication of a course or its contents, e.g., slides or presentations, are prohibited for copyright and data protection reasons. Courses and contents thereof may not be distributed in whole or in part without authorization, especially not on the internet or in social networks. Insofar as personal data is processed, the relevant data protection regulations must be observed. The courses and contents are intended exclusively for educational purposes. Violations of any kind, in particular unauthorized recording of courses or contents, unauthorized use or distribution of courses or contents, violations of personal rights, illegal and improper data processing, manipulation of courses or contents, or disclosure of user IDs or passwords, will be prosecuted and punished.

To order copies or request permission to reproduce materials, e-mail stefan.razinskas@fu-berlin.de.

Recap: Course Introduction

- The concept of innovation
  - Definition
  - Related key concepts (invention, creativity)
  - Different (organizational) levels where innovation takes place
- Typologizing innovation
  - Degree of innovation
  - Consequences of innovation
  - Content of innovation
- Innovation as a process
- Components of creativity in organizations

Today’s Session: Capability Assessment

- Innovations are made by people…
- … so we first need to identify and select the most appropriate employees to assign with innovative tasks.

- Many myths and stereotypes about the characteristics of creative individuals.

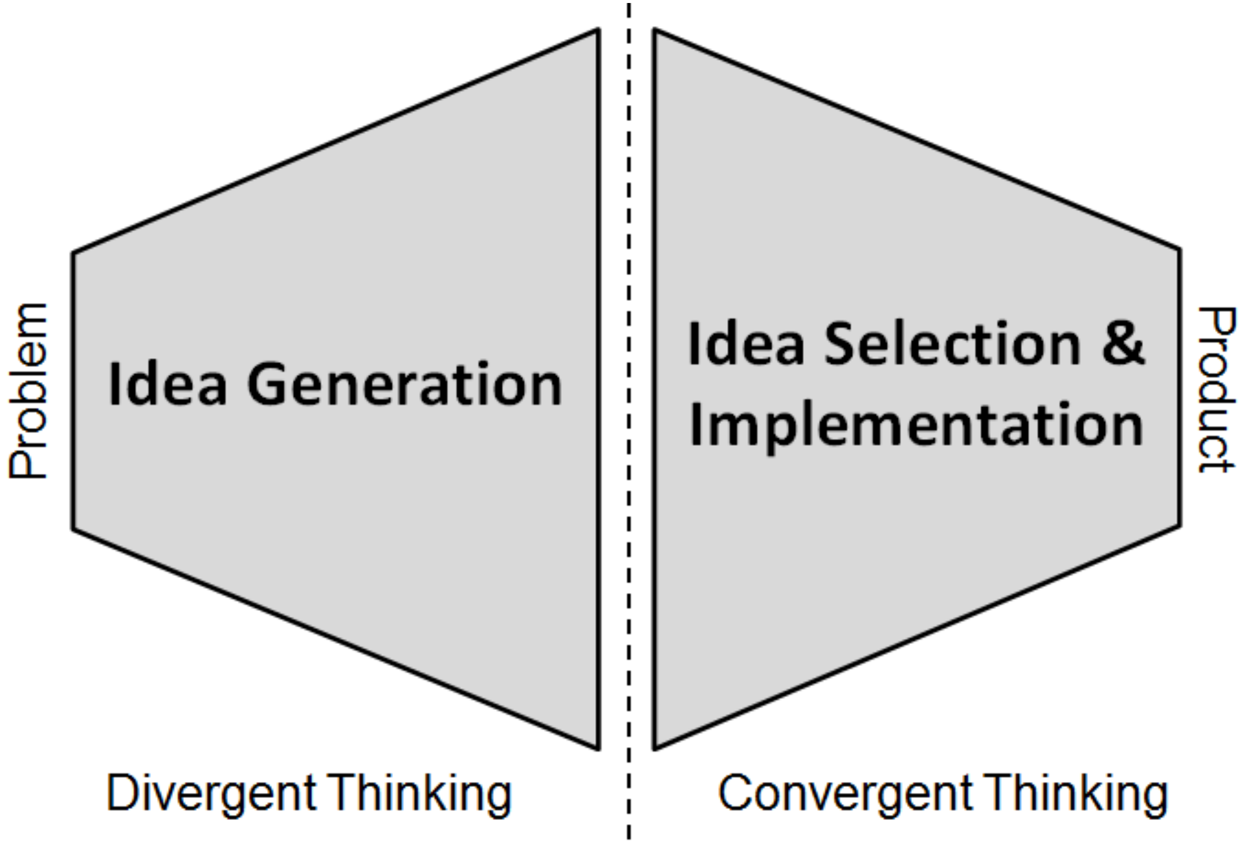
Today’s Session: Capability Assessment

- Some myths about creative individuals – is there any evidence?
  - Personality: Creative people are extraverted and “crazy”…
    - Some truth behind it, but also reflecting skills irrelevant for innovation (Martindale & Dailey, 1996; Batey & Furnham, 2008; Radel et al., 2015).
  - Handedness: Left-handed people are more creative…
    - Mixed results, but laterality strength (regardless of preference) consistently found to be negatively related to creativity (Badzakova-Trajkov et al., 2011)

➡ Creativity tends to be (wrongly) attributed to people that are “unique” or “special” in other ways (Lebuda & Karwowski, 2013; Proudfoot et al., 2015).

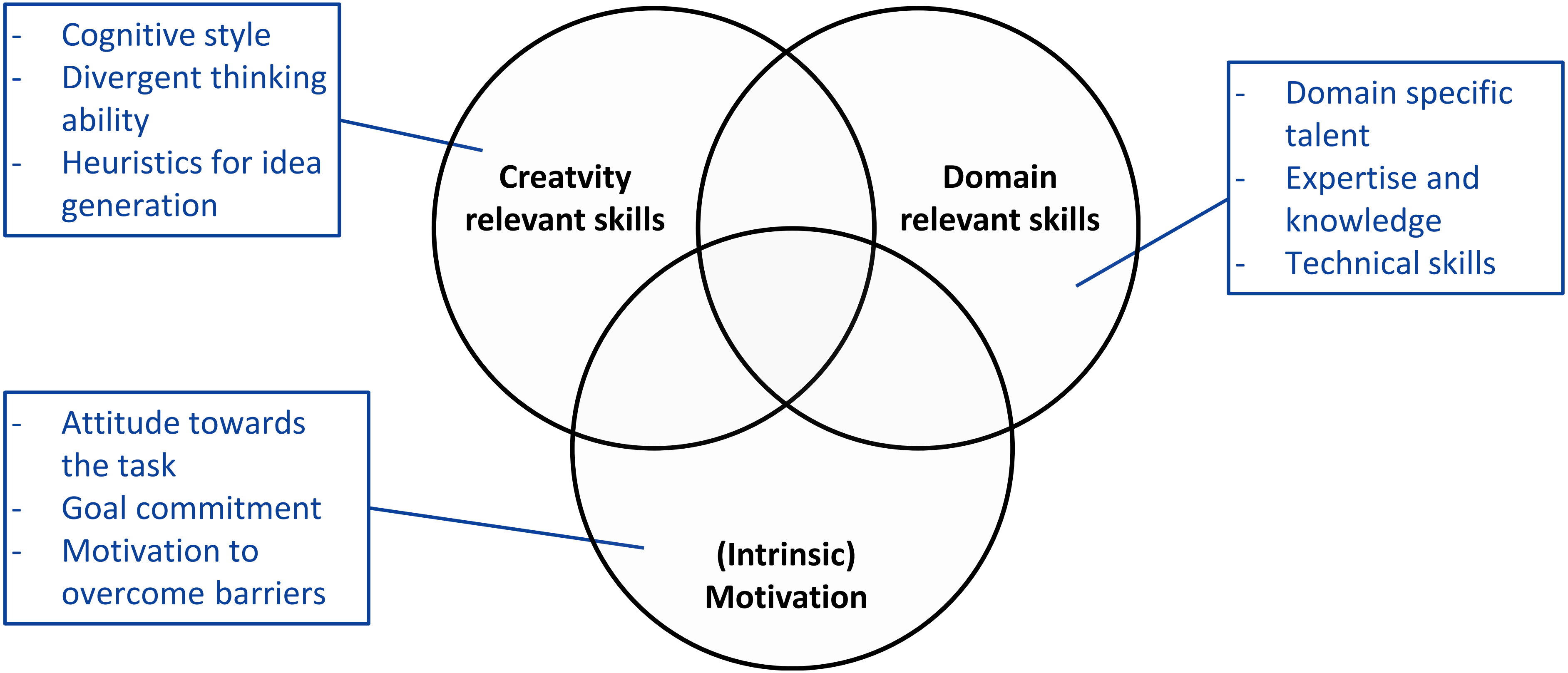
Innovation Capabilities

- Innovation process:



Assessing Creativity

- Components of creative performance (T. Amabile)



- Cognitive style
- Divergent thinking ability
- Heuristics for idea generation

Creatvity relevant skills

Domain relevant skills

- Domain specific talent
- Expertise and knowledge
- Technical skills

- Attitude towards the task
- Goal commitment
- Motivation to overcome barriers

(Intrinsic) Motivation

Amabile (1983, 1988)

Assessing Domain Relevant Skills

- Grades and certifications
  - E.g., school, university
- References
  - Prior jobs
- Achievements
  - Patents
  - Prizes
- Skill and knowledge tests
  - E.g., GMAT
  - Standardized or tailored tests

Assessing Intrinsic Motivation

- Personality attributes
  - Indicators: Need for achievement, difficulty preference, delayed gratification, locus of control, past behavior.
  - Instruments: Psychological tests, biographical interviews and questionnaires.
- Personal interest in the domain
  - Indicators: E.g., past activities, hobbies, electives.
  - Instruments: Biographical interviews and questionnaires, references.

Assessing Creativity Relevant Skills

- Assessing creative behavior
  - Checklists (Silvia et al., 2012)
    - List of behaviors and characteristics that are assumed to be associated with creativity to be rated by the applicant.
    - Many instruments (commercially) available.
    - Sample item: “Have you ever published a poem?”
    - BUT: Prone to manipulation.
  - Interviews
    - Directly asking applicants for such behaviors and characteristics.
    - BUT: Prone to manipulation and biased perceptions of the interviewer.

Assessing Creativity Relevant Skills *(cont.)*

- Past achievement
  - References, patents, inventions
    - Using past creative achievements as indicators of creativity relevant skills.
    - Objective, hard to manipulate, good predictive validity.
    - BUT:
      - Not applicable for job entrants, as long enough period of work in creative domains necessary for judgment, and
      - opportunity to apply and exhibit creativity relevant skills needed.

Assessing Creativity Relevant Skills *(cont.)*

- Test methods of creativity relevant skills
  - Intelligence tests? (Batey & Furnham, 2008;Kim, 2008; Lee & Therriault, 2013)
  - Divergent thinking tests
    - “Divergent thinking is cognition that leads in various directions” (Runco, 1999).

Divergent Thinking Tests *(cont.)*

- Four main components of divergent thinking:
  - Fluency: The number of responses to a given stimulus (Runco, 1999, 2004).
  - Originality: The uniqueness of responses to a given stimulus (Runco, 1999, 2004).
  - Flexibility: The number and/or uniqueness of categories of responses to a given stimulus (Guilford, 1968).
  - Elaboration: The extension of ideas within a specific category of responses to a given stimulus (Guilford, 1967).

Divergent Thinking Tests *(cont.)*

- Verbal tests:
  - The Alternate/Unusual Uses Test (Guilford, 1967).
  - The Remote Associates Test (RAT) (Mednick, 1962):
    - Underlying idea: Creative thinking bases on forming of mutually distant associative elements into new combinations (Mednick, 1968).
    - Examinees are presented with three words and are asked to come up with a word that associates the other three together.
    - Example: “cottage – blue – mouse”

Divergent Thinking Tests *(cont.)*

- Verbal tests:
  - The Alternate/Unusual Uses Test (Guilford, 1967).
  - The Remote Associates Test (RAT) (Mednick, 1962).
- Figural tests:
  - The Picture Construction/Completion Test (Torrance, 1962).
    - Participants are asked to use a basic shape to expand on it to create a picture / finish an incomplete drawing.
  - The dot connection test:
    - Participants are asked to draw four continuous straight lines, connecting all the dots without lifting their pencil from the paper.

Divergent Thinking Tests *(cont.)*

- Possible variations:

  Available time, maximum number of uses to be reported, using only a subsection of components, other scoring weights.

- Drawbacks:

  Scores susceptible to training effects, administration conditions, and specific sample.

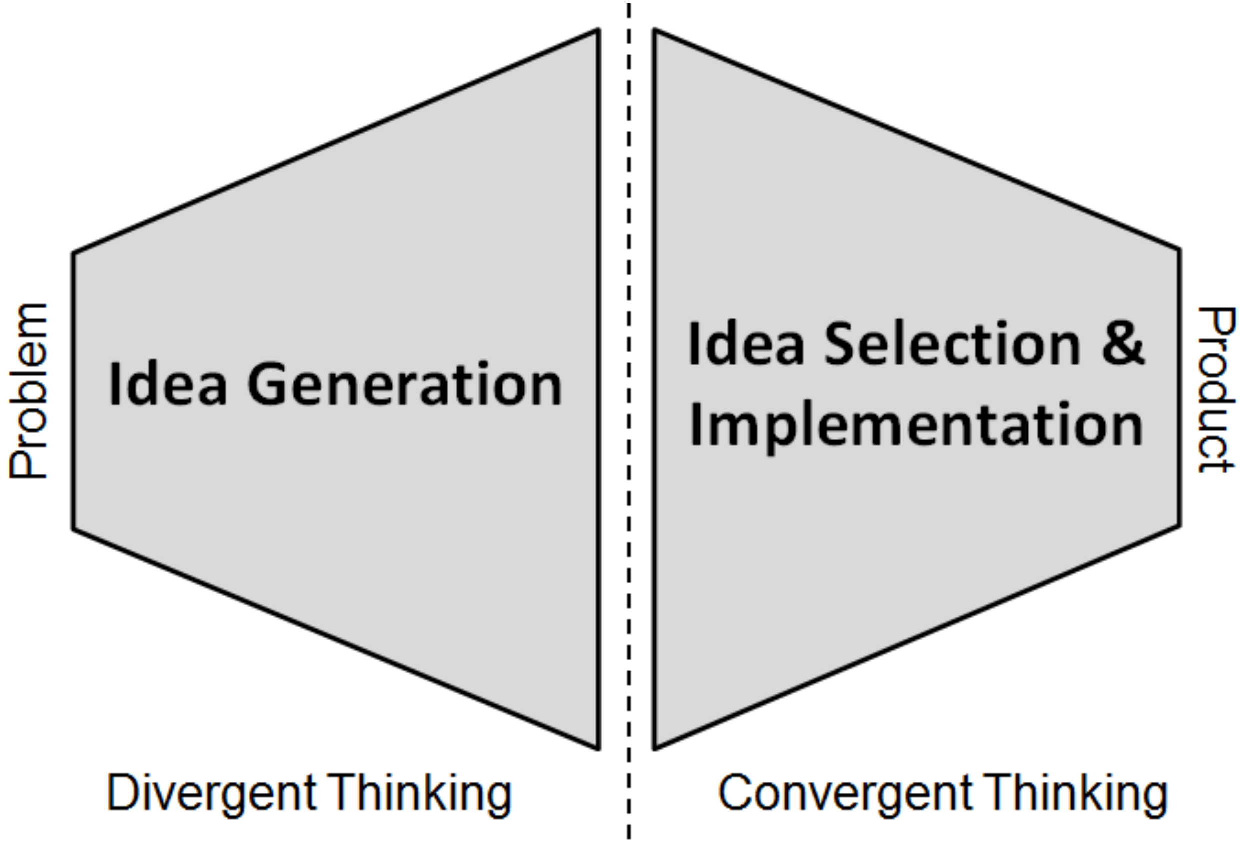
➡ **Might lead to low predictive validity.**

Assessing Creativity Relevant Skills

- Conclusion: There is no single best way to assess creativity relevant skills.
  - A lot of uncertainty associated with assessment methods and many potential drawbacks.
- Combination of assessment methods recommendable
  - Choice of methods to be combined basing on their incremental validity.
  - For example: Assessment centers.

Innovation Capabilities

- Innovation process:



Assessment of Capabilities for Implementing Creative Ideas

- “Promotors” or “Champions” of ideas:
  - Actively and enthusiastically promote an innovations’ progress through the critical organizational stages (Howell & Higgins, 1990).
  - Help overcome innovation barriers (Hauschildt & Kirchmann, 2001).
- Identification:
  - Past achievements (via references, biographical interviews and questionnaires).
  - Personality (via psychological tests).

Capabilities for Implementing Creative Ideas

(Baer, 2012; Howell & Higgins, 1990; Witte, 1973)

- Some overlap with key capabilities necessary for creative performance, for example:
  - Motivation
  - Domain relevant skills
  - Risk taking
- But also further capabilities needed, that are not of central importance for creativity, for example:
  - Communication skills
  - Political skills
  - Leadership skills (inspiration, charisma)
- …and capabilities that might even impede creative performance, for example:
  - Preference for convergent thinking / sense of reality
  - Idea evaluation and selection skills (feasibility, problem anticipation)

Capability Assessment: Takeaways

- Instruments for capability assessment:
  - Test instruments
  - Biographical interviews and questionnaires
  - Past achievements and references
- Divergent thinking as proxy for creativity relevant skills.
  - Four components of divergent thinking
  - Methods to test divergent thinking
- Capabilities for idea generation ≠ capabilities for idea evaluation and implementation.
  - “Promotors” / “champions” of ideas.

References

Amabile, T. M. 1983. The social psychology of creativity: A componential conceptualization. ***Journal of Personality and Social Psychology**, 45*(2), 357-376.

Amabile, T. M. 1988. A model of creativity and innovation in organizations. In B. M. Staw, & L. L. Cummings (Eds.), ***Research in organizational behavior***, Vol. 10: 123-167. Greenwich, CT, U.S.: JAI Press.

Badzakova-Trajkov, G., Häberling, I. S., & Corballis, M. C. 2011. Magical ideation, creativity, handedness, and cerebral asymmetries: A combined behavioural and fmri study. ***Neuropsychologia**, 49*(10), 2896-2903.

Baer, M. 2012. Putting creativity to work: The implementation of creative ideas in organizations. ***Academy of Management Journal**, 55*(5), 1102-1119.

Batey, M., & Furnham, A. 2006. Creativity, intelligence, and personality: A critical review of the scattered literature. ***Genetic, Social, and General Psychology Monographs**, 132*(4), 355-429.

Guilford, J. P. 1967. ***The nature of human intelligence***. New York; NY, U.S.: McGraw-Hill.

Guilford, J. P. 1968. ***Intelligence, creativity, and their educational implications***. San Diego, CA, U.S.: Knapp.

Hauschildt, J., & Kirchmann, E. 2001. Teamwork for innovation - the 'troika' of promotors. ***R&D Management**, 31*(1), 41-49.

Howell, J. M., & Higgins, C. A. 1990. Champions of technological innovation. ***Administrative Science Quarterly**, 35*(2), 317-341.

References *(cont.)*

Kim, K. H. 2008. Meta-analyses of the relationship of creative achievement to both IQ and divergent thinking test scores. ***Journal of Creative Behavior,*** *42*(2), 106-130.

Lebuda, I., & Karwowski, M. 2013. Tell me your name and I'll tell you how creative your work is: Author's name and gender as factors influencing assessment of products' creativity in four different domains. ***Creativity Research Journal,*** *25*(1), 137-142

Lee, C. S., & Therriault, D. J. 2013. The cognitive underpinnings of creative thought: A latent variable analysis exploring the roles of intelligence and working memory in three creative thinking processes. ***Intelligence,*** *41*(5), 306-320.

Martindale, C., & Dailey, A. 1996. Creativity, primary process cognition and personality. ***Personality and Individual Differences,*** *20*(4), 409-414.

Mednick, S. A. 1962. The associative basis of the creative process. ***Psychological Review,*** 69, 220-232.

Mednick, S. A. 1968. The remote associates test. ***Journal of Creative Behavior***, 2, 213-14.

Proudfoot, D., Kay, A. C., & Koval, C. Z. 2015. A gender bias in the attribution of creativity: Archival and experimental evidence for the perceived association between masculinity and creative thinking. ***Psychological Science***, 26(11), 1751-1761.

Radel, R., Davranche, K., Fournier, M., & Dietrich, A. 2015. The role of (dis)inhibition in creativity: Decreased inhibition improves idea generation. ***Cognition,*** *134*, 110-120.

References *(cont.)*

Runco, M. A. 1999. Divergent thinking. In M. A. Runco and S. Pritzker (Eds.), ***Encyclopedia of creativity***, San Diego, CA, U.S.: Academic Press.

Runco, M. A. 2004. Creativity. ***Annual Review of Psychology***, *55*(1), 657-687.

Shobe, E. R., Ross, N. M., & Fleck, J. I. 2009. Influence of handedness and bilateral eye movements on creativity. ***Brain and Cognition***, *71*(3), 204-214.

Silvia, P. J., Wigert, B., Reiter-Palmon, R., & Kaufman, J. C. 2012. Assessing creativity with self-report scales: A review and empirical evaluation. ***Psychology of Aesthetics, Creativity, and the Arts***, *6*(1), 19-34.

Torrance, E. P. 1962. ***Guiding creative talent***. Englewood Cliffs, NJ, U.S.: Prentice-Hall.

Witte, E. 1973. ***Organisation für Innovationsentscheidungen: Das Promotoren-Modell***. Göttingen, Germany: Schwartz.

The Human Side of Innovation Projects

Session 3:

The development of innovation capabilities

No copying, photographing, video recording allowed.

© Prof. Dr. Stefan Razinskas. School of Business and Economics | Department of Management | FU Berlin. All rights reserved.

The recording and duplication of a course or its contents, e.g., slides or presentations, are prohibited for copyright and data protection reasons. Courses and contents thereof may not be distributed in whole or in part without authorization, especially not on the internet or in social networks. Insofar as personal data is processed, the relevant data protection regulations must be observed. The courses and contents are intended exclusively for educational purposes. Violations of any kind, in particular unauthorized recording of courses or contents, unauthorized use or distribution of courses or contents, violations of personal rights, illegal and improper data processing, manipulation of courses or contents, or disclosure of user IDs or passwords, will be prosecuted and punished.

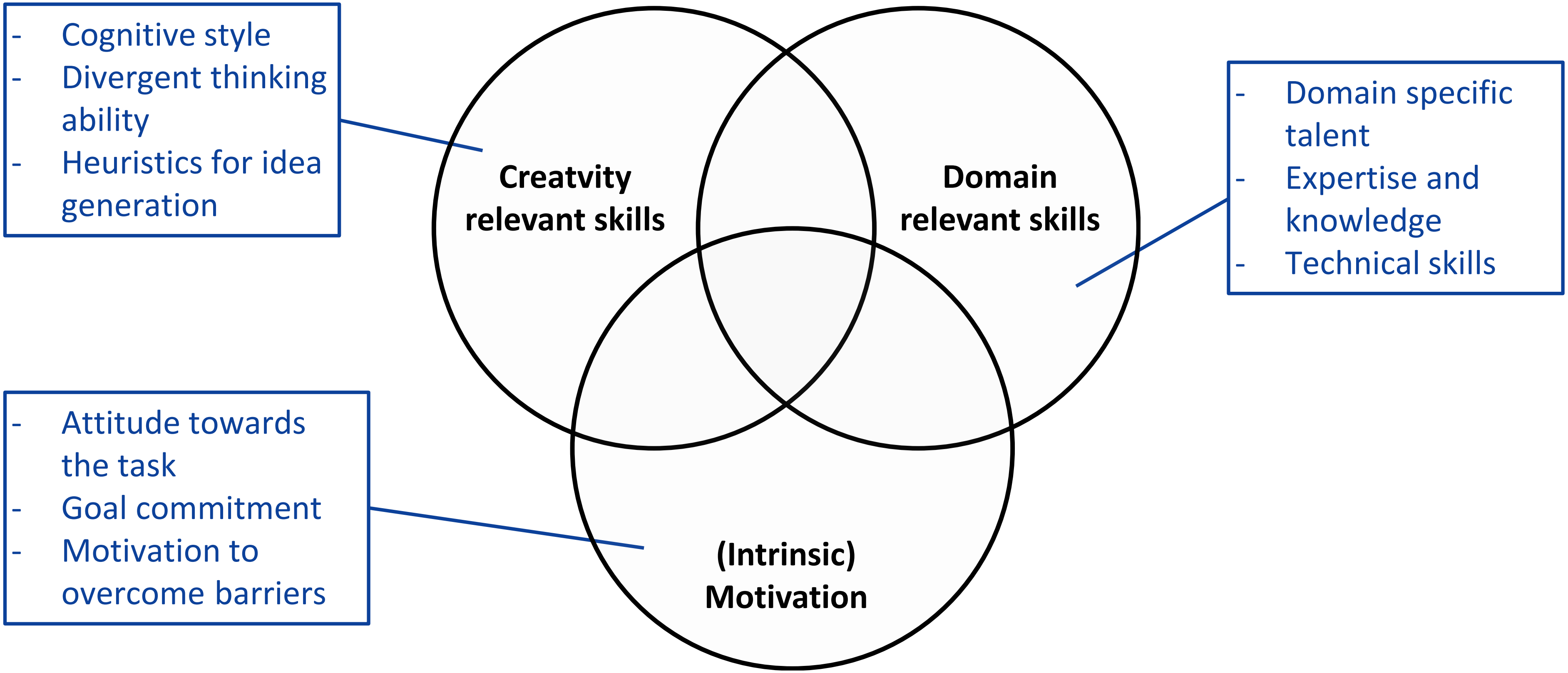
To order copies or request permission to reproduce materials, e-mail stefan.razinskas@fu-berlin.de.

Recap: Capability Assessment

- Instruments for capability assessment:
  - Test instruments (personality, abilities)
  - Biographical questionnaires
  - Past achievements and references
- Divergent thinking as proxy for creativity relevant skills.
  - Four components of divergent thinking
  - Methods to test divergent thinking
- Capabilities for idea generation ≠ capabilities for idea evaluation and implementation.

Developing & Enhancing Creativity

- Components of creative performance (T. Amabile)



- Cognitive style
- Divergent thinking ability
- Heuristics for idea generation

Creatvity relevant skills

Domain relevant skills

- Domain specific talent
- Expertise and knowledge
- Technical skills

- Attitude towards the task
- Goal commitment
- Motivation to overcome barriers

(Intrinsic) Motivation

Amabile (1983, 1988)

Enhancing Creativity Relevant Skills

- Providing tools to enhance creative thinking: Creativity techniques.
  - Tactics, strategies, and heuristics to apply when having to come up with creative ideas (Runco, 2004).
  - Three main approaches for creativity techniques:
    - Unbounded methods
    - Bounded methods
    - Systematic analogies

Unbounded Creativity Techniques

- Based on the traditional assumption for idea generation that when it comes to creativity, quantity breeds quality (Thompson & Brajkovich, 2003).
- Problems associated with unbounded methods:
  - Unbounded methods tend to lead to products that are not commensurate with the company's brand image and capabilities (Goldenberg et al., 2001).
  - Most ideas found through unbounded methods tend to be of limited originality (Ward, 1994).

Unbounded Creativity Techniques *(cont.)*

- Functional fixedness (Duncker, 1945) / Design stance (Dennett, 1987):
  - People are highly influenced by the purpose something was designed for.
  - Hard to see which other purposes an artifact could also be used for, even if it was not designed for that purpose.

Unbounded Creativity Techniques *(cont.)*

- Path of least resistance (Ward, 1994):
  - The default approach in creative tasks is to implement the first solution that comes to mind.
  - This first solution is usually based on a previous solution from own experience or a category exemplar (Audia & Goncalo, 2007).
  - Explanation: To stray from a path of least resistance requires more cognitive resources and creates more uncertainty in the outcome.

Bounded Creativity Techniques

- Based on the assumption that the human mind is most creative when it has to overcome constraints (Goldenberg et al., 2001).
- Bounded methods:
  - Actively precluding certain methods or key features of the solution space (Stokes, 2001; 2006).
  - TRIZ: Generalizable patterns of invention (Goldenberg et al, 1999).
    - Based on a content analysis of more than 40,000 patents.
    - 40 inventive principles

Enhancing Creativity Relevant Skills *(cont.)*

- Unbounded as well as bounded methods suffer from certain drawbacks.
- Combining bounded and unbounded methods:
    - E.g.: Morphological box.

Enhancing Creativity Relevant Skills *(cont.)*

- Using systematic analogies: Search for analogies that can be transferred from another field to the problem at hand
  - Numerous examples demonstrate substantial innovations that result from transferring problem solutions from one industry to another (Kalogerakis & Herstatt, 2005).
- From nature in Bionics (Junior & Guanabara, 2005).

Enhancing Creativity Relevant Skills *(cont.)*

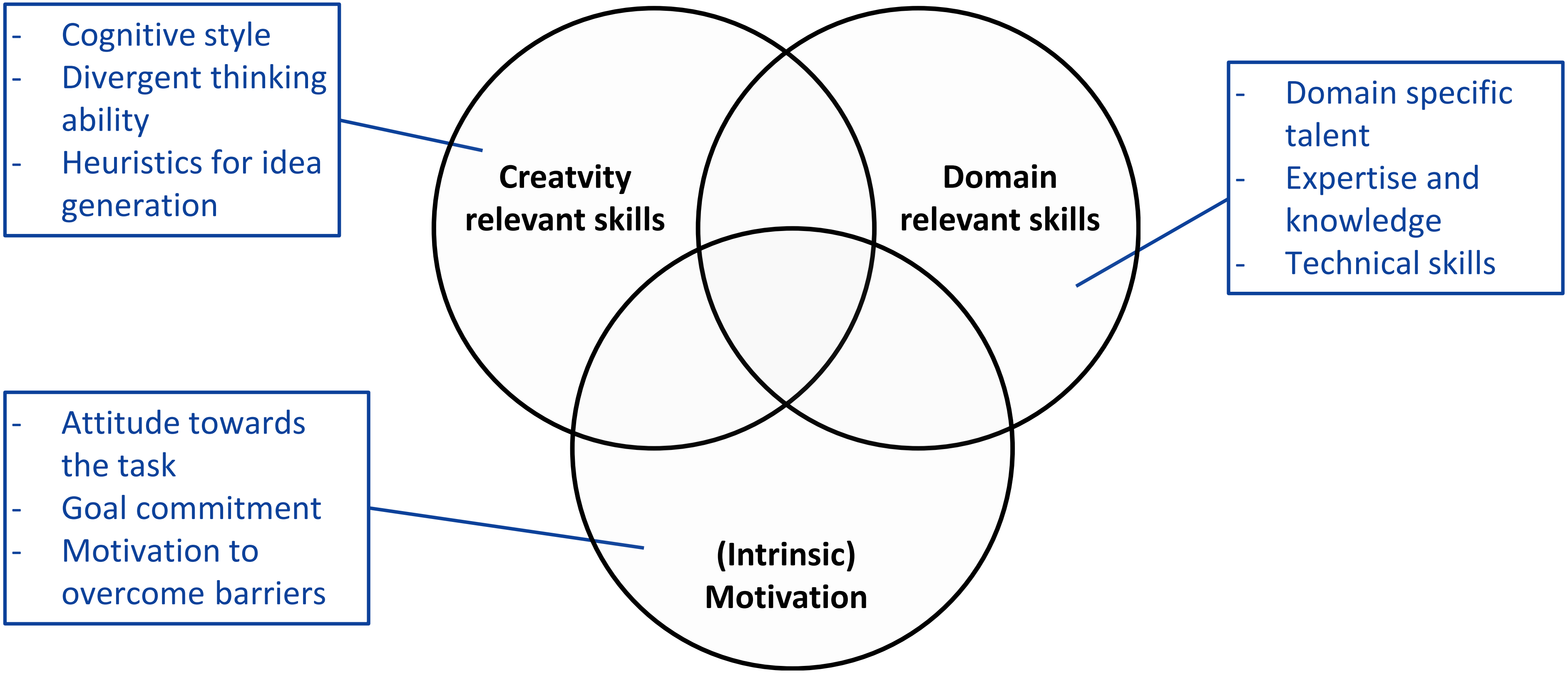
- Enhancing creative capacity
  - Avoiding chronic stress (Duman & Aghajanian, 2012; Eisch & Petrik, 2012).
  - Learning new things (Duman & Aghajanian, 2012; Gilkey & Kilts, 2007 Maddux et al., 2010):
    - Languages
    - Activities: E.g., juggling, new sports or instruments
  - Making new experiences (Bergmann & Frisen, 2013; Fee et al., 2012):
    - Travelling
    - Working abroad
  - Physical exercise (Collins et al., 2009; McEwen et al., 2012).
  - Positive mood (Friedman & Förster, 2010).

Enhancing Creativity Relevant Skills *(cont.)*

- Mood and Creativity:
  - Mood states influence the mode of human thinking.
  - Positive mood states (like joy or interest) result in a wider attentional set, more global cognitive processing, and flatter associative hierarchies (Fredrickson, 2001; Fredrickson & Branigan, 2005; Friedman & Förster, 2010).
  - Being in a positive mood state enhances the likelihood of recognizing novel possibilities for combining concepts or components (Isen et al., 1985, 1987; Baas et al., 2008).
  - Avoidance / prevention motivations (e.g., anxiety) tend to lead to a narrower focus in cognition (Baas et al., 2008).

Developing & Enhancing Creativity

- Components of creative performance (T. Amabile)



Creatvity relevant skills

- Cognitive style
- Divergent thinking ability
- Heuristics for idea generation

Domain relevant skills

- Domain specific talent
- Expertise and knowledge
- Technical skills

(Intrinsic) Motivation

- Attitude towards the task
- Goal commitment
- Motivation to overcome barriers

Amabile (1983, 1988)

Motivating Innovators

- How to motivate employees?
  - Rewards.
  - Task characteristics: Job Characteristics Theory by Hackman & Oldham (1976).
  - Promotion: (Prospect of) Climbing up the career ladder, usually indicated by the number of subordinates.
- Substantial differences between “regular employees” and innovators!

Rewarding Innovators

- Contradicting notions in literature:
- PRO (Eisenberger & Selbst, 1994; Eisenberger & Rhoades, 2001):
  - Informational aspects of rewards: Added emphasis on goals and desired behaviors.
  - Rewards might be expected by innovators, resulting in a decrease of motivation if lacking (hygiene factor).
- CONTRA (Amabile, 1982, 1997):
  - Crowding out effect – extrinsic motivation substituting intrinsic motivation (over sufficient justification).
  - Might result in a perceived loss of autonomy.

Rewarding Innovators *(cont.)*

- How to overcome these drawbacks?
- Recommendations derived from meta-analytic research (Byron & Khazanchi, 2012):
  - Reward creativity, not performance or output.
  - Avoid perception of being controlled.
  - Repeated rewards.
  - Feedback: Rewards as an indicator of professional development.
- Reward contingent with creative effort, e.g., through tournaments, idea support (Neckermann et al., 2014).

Motivating Innovators *(cont.)*

- How to motivate employees?
  - Task characteristics: Job Characteristics Theory (Hackman & Oldham, 1976).

Task Dimensions	Employees in general	Innovators
Skill Variety	Utilize one‘s skills and abilities	Learn and develop new skills and abilities
Task Identity	Become a contributing member of the organization	Become a contributing member of the profession
Task Significance	Work on projects that are important to the organization	Work on projects that are exciting within the profession
Autonomy	Strategic clarity	Operational autonomy
Feedback	Subjective data and information processes	Objective data and information processes

adapted from Katz (2004)

Motivating Innovators *(cont.)*

- How to motivate innovators?
  - Specific career management practices: The “Dual Ladder” (e.g., McMarlin, 1957; Shephard, 1958).
    - Implementation of a second hierarchy in the organizational structure for technical professionals.
    - Minimal increase of leadership and administrative tasks with promotion in the technical ladder.
    - Alternative rewards for advancing on the technical ladder.
    - Widely used in practice since the 1970s (Cantrall et al., 1977) in firms like Goodyear, IBM, etc.

The Dual Ladder Career System

- Problems associated with dual ladders:
  - Perceived lack of recognition of the technical ladder (Gerpott et al., 1988; Igbaria et al., 1999).
  - Technical ladder often used as a siding (Van Wees & Jansen, 1994).
  - Missing/unclear criteria for advancement on the technical ladder (Cordero et al., 1994).
  - Perceived lack of fairness of the dual ladder system (Allen & Katz, 1986; Katz & Tushman, 1990).
- In many cases, dual ladders fail to achieve the targeted motivational effects (Allen & Katz, 1992; Van Wees & Jansen, 1994).

The Dual Ladder Career System *(cont.)*

- Success of dual ladders depends on perceived fairness (Hoffmann et al., 2016).
- Consequences for designing dual ladders (Hoffmann et al., 2016):
  - Transparency of the dual ladder:
    - Procedures and criteria underlying personnel selection and promotion decisions should be clear to the innovators.
    - Measures: Accessible and clear job descriptions, qualification requirements, performance standards.
  - (Perceived) Equality of the two ladders:
    - Recognition of the technical ladder.
    - Measures: Publishing promotions on the technical ladder, career counseling, explicit information about equality of ranks and titles, emphasizing the importance of innovation.

Development & Motivation: Takeaways

- Domain relevant skills
  - Easy to develop by training, etc.
- Enhancement of creativity relevant skills possible through…
  - ... appropriate techniques (better leveraging existing capacity).
  - ... increasing creative capacity.
- Motivation
  - Drivers of motivation are different for innovators.
  - Ambiguous role of rewards.
  - Specific ways to maintain and increase innovators’ motivation.

References

Allen, T., & Katz, R. 1986. The dual ladder: Motivational solution or managerial delusion? ***R&D Management**, 16*(2), 185-185.

Allen, T., & Katz, R. 1992. Age, education and the technical ladder. ***IEEE Transactions on Engineering Management**, 39*(3), 237-237.

Amabile, T. M. 1983. The social psychology of creativity: A componential conceptualization. ***Journal of Personality and Social Psychology**, 45*(2), 357-376.

Amabile, T. M. 1988. A model of creativity and innovation in organizations. ***Research in Organizational Behavior**, 10*, 123.

Amabile, T. M. 1997. Motivating creativity in organizations: On doing what you love and loving what you do. ***California Management Review**, 40*(1), 39-58.

Arnsten, A. F. T. 2009. Stress signalling pathways that impair prefrontal cortex structure and function. ***Nature Reviews Neuroscience**, 10*(6), 410-422.

Audia, P. G., & Goncalo, J. A. 2007. Past success and creativity over time: A study of inventors in the hard disk drive industry. ***Management Science**, 53*(1), 1-15.

Bergmann, O., & Frisén, J. 2013. Why adults need new brain cells. ***Science**, 340*(6133), 695-696.

Byron, K., & Khazanchi, S. 2012. Rewards and creative performance: A meta-analytic test of theoretically derived hypotheses. ***Psychological Bulletin**, 138*(4), 809-830.

Cantrall, E., Manly, D. G., Schroeter, D., & Wakeham, H. 1977. The dual ladder-successes and failures. ***Research Management**, 20*(4), 30-33.

References *(cont.)*

Collins, A., Hill, L. E., Chandramohan, Y., Whitcomb, D., Droste, S. K., & Reul, J. M. H. M. 2009. Exercise improves cognitive responses to psychological stress through enhancement of epigenetic mechanisms and gene expression in the dentate gyrus. ***PLoS ONE**, 4*(1), 4330.

Cordero, R., DiTomaso, N., & Farris, G. F. 1994. Identifying and developing promotability in Research & Development laboratories. ***Journal of Engineering & Technology Management**, 11*(1), 55-72.

Dennett, D. 1987. ***The Intentional Stance***. Cambridge, MA, U.S.: MIT Press.

Duman, R. S., & Aghajanian, G. K. 2012. Synaptic dysfunction in depression: Potential therapeutic targets. ***Science**, 338*(6103), 68-72.

Duncker, K. 1945. On problem solving. ***Psychological Monographs**, 58*(5).

Eisch, A. J., & Petrik, D. 2012. Depression and hippocampal neurogenesis: A road to remission? ***Science**, 338*(6103), 72-75.

Eisenberger, R., & Rhoades, L. 2001. Incremental effects of reward on creativity. ***Journal of Personality and Social Psychology**, 81*(4), 728-741.

Eisenberger, R., & Selbst, M. 1994. Does reward increase or decrease creativity? ***Journal of Personality and Social Psychology**, 66*(6), 1116-1127.

Fee, A., & Gray, S. J. 2012. The expatriate-creativity hypothesis: A longitudinal field test. ***Human Relations**, 65*(12), 1515-1538.

Fredrickson, B. L. 2001. The role of positive emotions in positive psychology: The broaden-and-build theory of positive emotions. ***American Psychologist**, 56*(3), 218-226.

References *(cont.)*

Fredrickson, B. L., & Branigan, C. 2005. Positive emotions broaden the scope of attention and thought-action repertoires. ***Cognition & Emotion****, 19*(3), 313-332.

Friedman, R. S., & Förster, J. 2010. Implicit affective cues and attentional tuning: An integrative review. ***Psychological Bulletin****, 136*(5), 875-893.

Gerpott, T., Domsch, M., & Keller, R. T. 1988. Career orientations in different countries and companies: An empirircal investigation of german, british and us R&D professionals. ***Journal of Management Studies****, 25*(5), 439.

Gilkey, R., & Kilts, C. 2007. Cognitive fitness. ***Harvard Business Review****, 85*(11), 53-66.

Goldenberg, J., Lehmann, D. R., & Mazursky, D. 2001. The idea itself and the circumstances of its emergence as predictors of new product success. ***Management Science****, 47*(1), 69.

Goldenberg, J., Mazursky, D., & Solomon, S. 1999. Toward identifying the inventive templates of new products: A channeled ideation approach. ***Journal of Marketing Research****, 36*(2), 200-210.

Igbaria, M., & Kassicieh, S. K. 1999. Career orientations and career success among research, and development and engineering. ***Journal of Engineering and Technology Management****, 16*(1), 29.

Hackman, J. R., & Oldham, G. R. 1976. Motivation through the design of work: Test of a theory. ***Organizational Behavior and Human Performance****, 16*(2), 250-279.

Hoffmann, P., Hoegl, M., Muethel, M. and Weiss, M. 2016. A contemporary justice perspective on dual ladders for R&D professionals. ***Journal of Product Innovation Management***, *33*(5), 589-612.

Isen, A. M., Daubman, K. A., & Nowicki, G. P. 1987. Positive affect facilitates creative problem solving. ***Journal of Personality and Social Psychology****, 52*(6), 1122-1131.

References *(cont.)*

Isen, A. M., Johnson, M. M. S., Mertz, E., & Robinson, G. F. 1985. The influence of positive affect on the unusualness of word associations. ***Journal of Personality and Social Psychology****, 48*(6), 1413.

Junior, W. K., & Guanabara, A. S. 2005. Methodology for product design based on the study of bionics. ***Materials and Design****, 26*(2), 149-155.

Katz, R. 2004. Motivating professionals in organizations. In Katz, R. (Ed.), ***The human side of managing technological innovation*** (2nd ed.). New York: Oxford University Press.

Katz, R., & Tushman, M. 1990. ***Exploring the dynamics of dual ladders: A longitudinal study****.* Academy of Management Proceedings.

Kouneiher, F., Charron, S., & Koechlin, E. 2009. Motivation and cognitive control in the human prefrontal cortex. ***Nature Neuroscience****, 12*(7), 939-945.

Maddux, W., Adam, H., & Galinsky, A.D. 2010. When in Rome Learn why the romans do what they do: How multicultural learning experiences facilitate creativity. ***Personality & Social Psychological Bulletin****, 36*(6), 731-741.

McEwen, B. S., Eiland, L., Hunter, R. G., & Miller, M. M. 2012. Stress and anxiety: Structural plasticity and epigenetic regulation as a consequence of stress. ***Neuropharmacology****, 62*(1), 3-12.

McGrath, R. G., Keil, T., & Tukiainen, T. 2006. Extracting value from corporate venturing. ***MIT Sloan Management Review****, 48*(1), 50-56.

McMarlin, R. D. 1957. Parallel progression: Careers for non-supervisory engineers and scientists. ***Personnel Administration****, 20*(2), 38-42.

References *(cont.)*

Neckermann, S., Warnke, A. J., & Bradler, C. 2014. Rewards and performance: A comparison across creative and routine tasks, ***Academy of Management Conference***. Philadelphia.

Runco, M. A. 2004. Creativity. ***Annual Review of Psychology***, *55*(1), 657-687.

Shepard, H. A. 1958. The dual hierarchy in research. ***Research Management***, *1*, 177-187.

Stokes, P. D. 2001. Variability, constraints, and creativity. ***American Psychologist***, *56*(4), 355.

Stokes, P. D. 2006. *Creativity from constraints:* ***The psychology of breakthrough***. New York, NY, U.S.: Springer.

Thompson, L., & Brajkovich, L. F. 2003. Improving the creativity of organizational work groups. ***Academy of Management Executive***, *17*(1), 96-109.

van Wees, L., & Jansen, P. 1994. Dual ladder 'in balance'. ***The International Journal of Career Management***, *6*(3), 11-19.

Ward, T. B. 1994. Structured imagination: The role of category structure in exemplar generation. ***Cognitive Psychology***, *27*(1), 1.

Prof. Dr. Stefan Razinskas
School of Business and Economics | Department of Management

Freie Universität Berlin

The Human Side of Innovation Projects

Session 4:

Resilience and innovation

No copying, photographing, video recording allowed.

© Prof. Dr. Stefan Razinskas. School of Business and Economics | Department of Management | FU Berlin. All rights reserved.

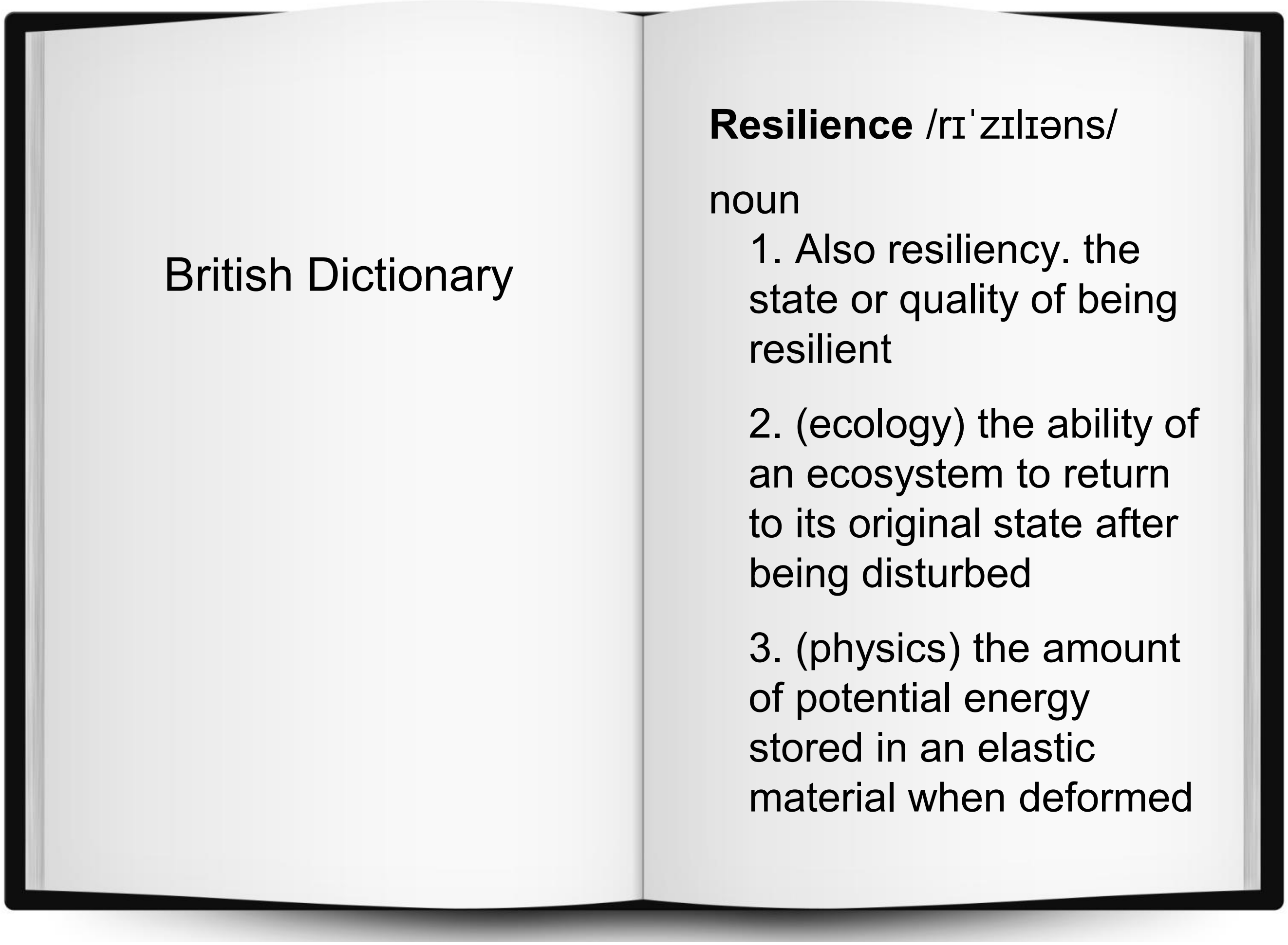
The recording and duplication of a course or its contents, e.g., slides or presentations, are prohibited for copyright and data protection reasons. Courses and contents thereof may not be distributed in whole or in part without authorization, especially not on the internet or in social networks. Insofar as personal data is processed, the relevant data protection regulations must be observed. The courses and contents are intended exclusively for educational purposes. Violations of any kind, in particular unauthorized recording of courses or contents, unauthorized use or distribution of courses or contents, violations of personal rights, illegal and improper data processing, manipulation of courses or contents, or disclosure of user IDs or passwords, will be prosecuted and punished.

To order copies or request permission to reproduce materials, e-mail stefan.razinskas@fu-berlin.de.

Recap: Development & Motivation

- Domain relevant skills
  - Easy to develop by training, etc.
- Enhancement of creativity relevant skills possible through…
  - ... appropriate techniques (better leveraging existing capacity).
  - ... increasing creative capacity.
- Motivation
  - Drivers of motivation are different for innovators.
  - Ambiguous role of rewards.
  - Specific ways to maintain and increase innovators' motivation.

Resilience – Definition



British Dictionary

Resilience /rɪˈzɪlɪəns/

noun

1. Also resiliency. the state or quality of being resilient
2. (ecology) the ability of an ecosystem to return to its original state after being disturbed
3. (physics) the amount of potential energy stored in an elastic material when deformed

Psychological Resilience – Definition

Resilience is the “**positive adaptation within the context of significant adversity.**” (Luthar et al., 2000: 543)

Resilience is a **two-dimensional** construct concerning both the exposure of (1) **adversity or risk** and the (2) **positive adjustment** outcomes of that.

(Luthar & Cicchetti, 2000; Masten & Obradovic, 2006)

History

1950s

Emmy Werner (1982) & R. Smith (1992)
Long-time Study (1955-1985) in Hawaii, Children at risk. Complete Birth cohort of Kauai of 1955.
Adversity/Risk: Perinatal stress, poverty, daily instability, and serious parental mental health problems.
Positive Adjustment: Development into caring, competent and confident adults.

Michael Rutter (1979, 1985)
Series of studies on inner-city London Youth & Island of Wight Youth.
Adversity/Risk & Adjustments: Wide variety of risks & adjustments

Garmezy (1991); Masten & Tellegen (1984)
Minnesota Risk Research Project. Dysfunction in children of schizophrenic parents 1971-1982.
Adversity/Risk: Schizophrenic parents
Positive Adjustment: Not becoming maladaptive adults, growing up to be warm and competent.

Jack Block (1982)
Long-time Study (for almost 30 years) Cohort of 100 San Francisco Bay Area toddlers.
Adversity/Risk: Wide variety of risks
Positive Adjustment: Choices and outcomes of lives.

1990s

Peter Benson (1997)
350000 6th to 12th grade students in 600 communities 1990-1995.
Adversity/Risk: Schizophrenic parents
Positive Adjustment: Not becoming maladaptive adults, growing up to be warm and competent.

Research was later extended to adult resilience, mostly measured by the absence of PTSD (post traum-atic stress disorder) or depression. Main focus on the resilience after traumatic experiences like the death of a spouse, war or on the September 11th terrorist attacks (e.g., Bonnano 2004 & et al. 2006).

Protective Factors

(Garmezy, 1991)

Triad of Protective Factors

Personal Dispositional Attributes*

Female; socially responsible; adaptable; tolerant; achievement oriented; a good communicator; self-esteem; easy temperament; self-efficacy; effectiveness; positive outlook; internal locus of control; self-discipline; good problem solving skills, humor; values; sense of purpose, ...

Supportive Family Environment*

Caregiving family environment;
Warm and close relationship with an adult family member

External Support Resources*

Caregiving external environment;
Positive school climate;
Warm and close relationship with an adult

> "The **character, trait, or situational premise** of resiliency is that people possess selective strengths or assets to help them survive adversity." (Richardson 2002: 309).

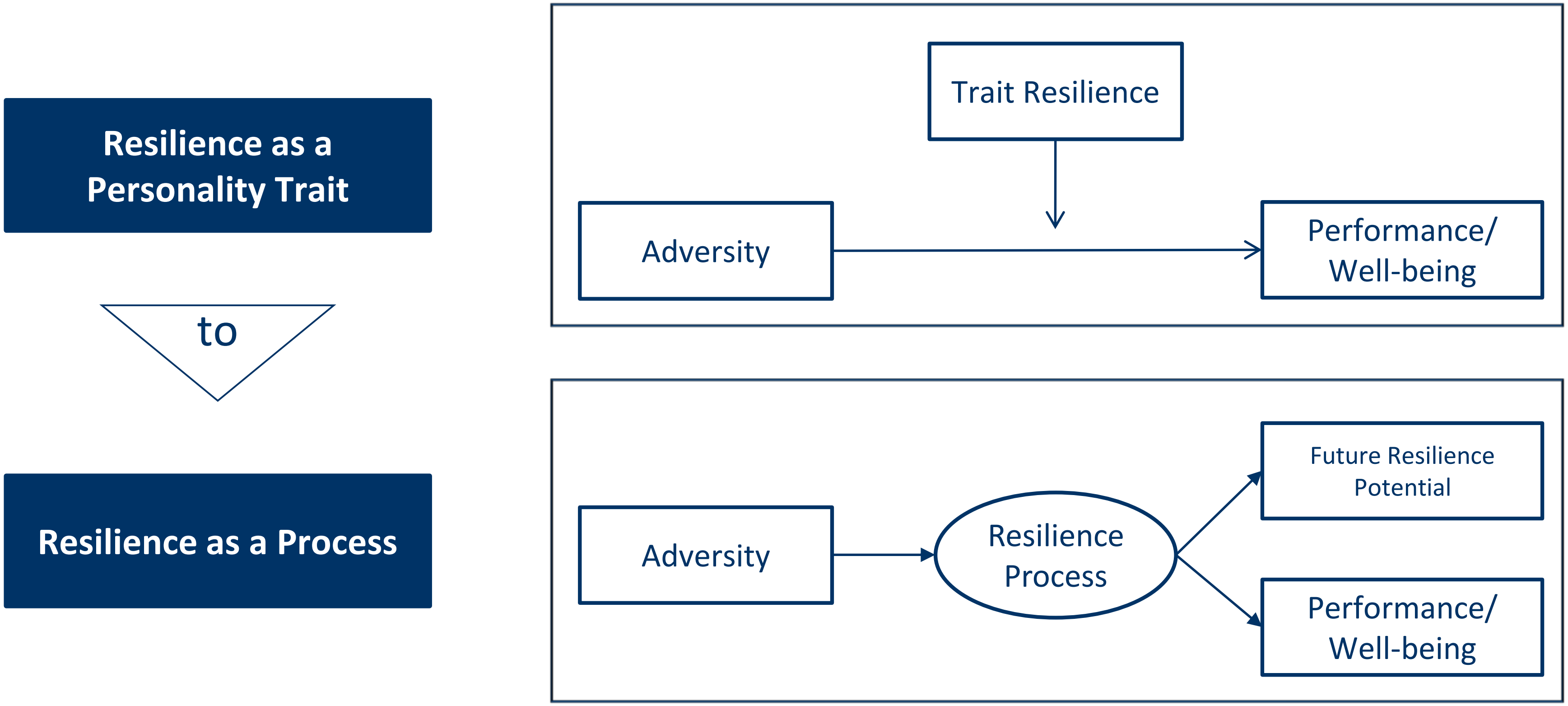
* In the boxes are examples of protective factors retrieved from Werner 1982, Werner & Smith 1992; Rutter 1979, 1985; Garmezy et al. 1984, Benson 1997.

Example – Resilience Factor Inventory

The **Resilience Factor Inventory® (RFI)** - Reivich & Shatte (2002) - is a 60 item instrument that measures 7 essential ingredients of Resilience. It is also based on research of Martin Seligmann (e.g., Seligman 1998; Seligman & Csikszentmihalyi, 2000) conducted in the field of positive psychology.

- **Emotion Regulation** – keeping your emotions in check
- **Impulse Control** – keeping your behavior in check
- **Causal Analysis** – diagnosing and solving problems effectively
- **Self-efficacy** – belief in your ability to handle situations that come your way
- **Realistic Optimism** – belief in a bright future, but within the bounds of your reality
- **Empathy** – identifying what motivates others
- **Reaching Out** – seeking out new opportunities, challenges and relationships

From Trait Resilience to Resilience as a Process



Resilience as a Personality Trait

to

Resilience as a Process

… recent research tends to understand resilience as a “**dynamic process** encompassing **positive adaptation** within the context of **significant adversity**” (Luthar et al., 2000: 534).

From Trait Resilience to Resilience as a Process

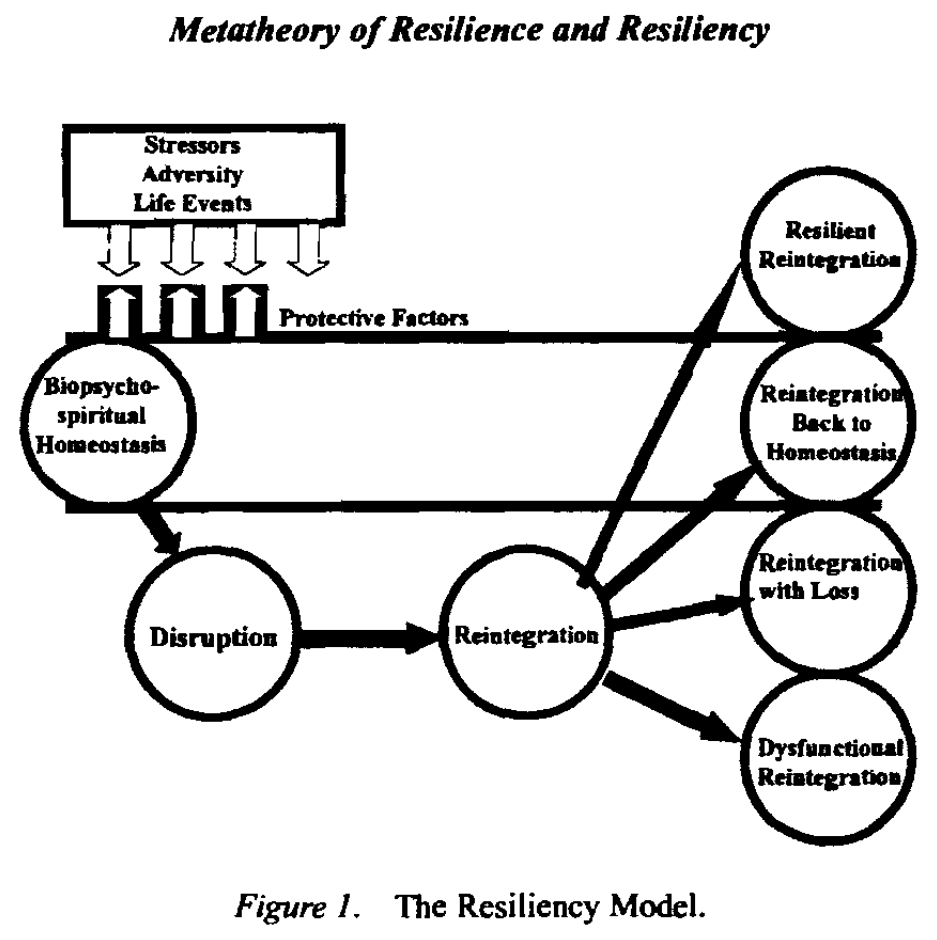

Metatheory of Resilience and Resiliency
Stressors
Adversity
Life Events
Protective Factors
Biopsycho-spiritual Homeostasis
Disruption
Reintegration
Resilient Reintegration
Reintegration Back to Homeostasis
Reintegration with Loss
Dysfunctional Reintegration

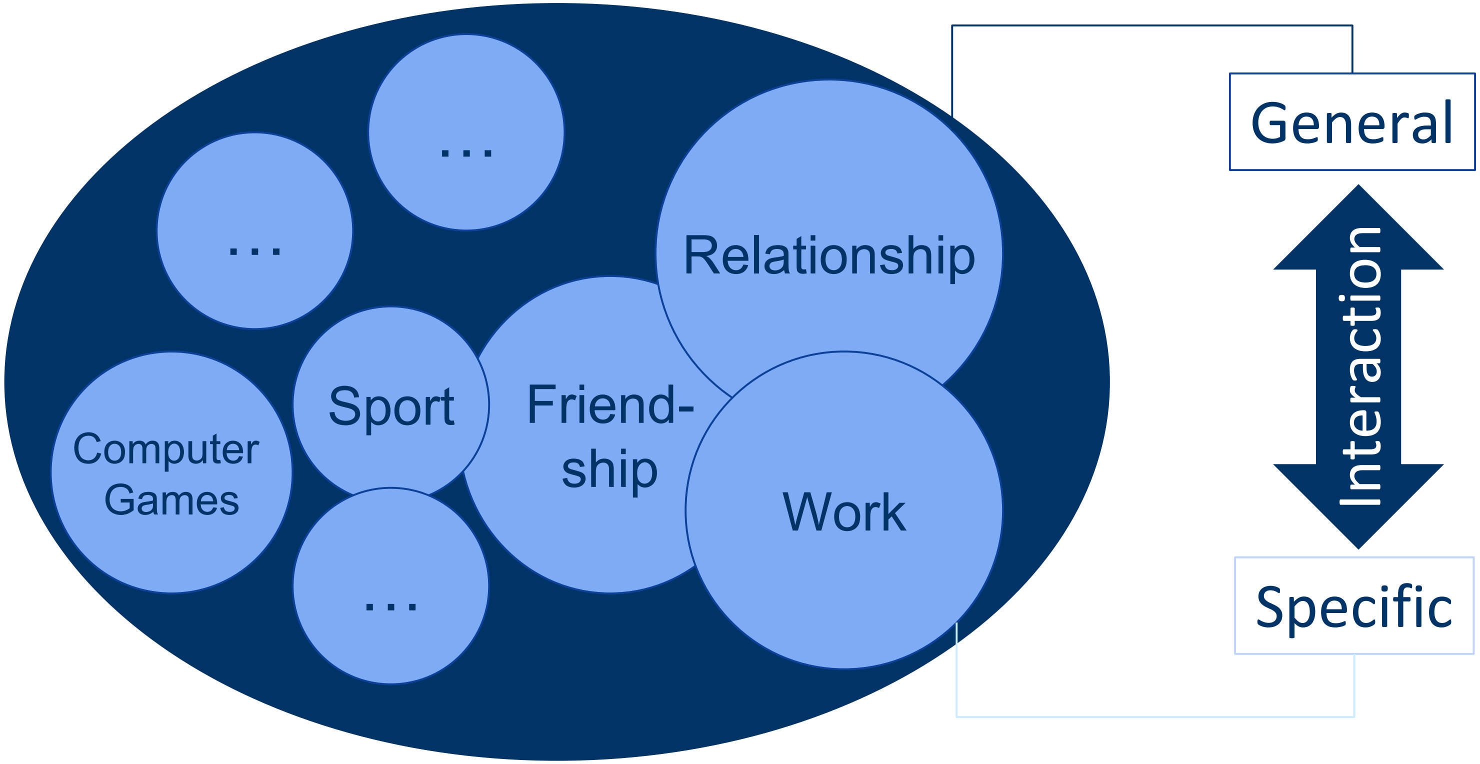
Figure 1. The Resiliency Model.

*Richardson (2002: 311)

General vs. Specific Resilience

Presumably there is a general resilience, which is relatively stable over all areas in live and over time.

There is also specific resilience for the specific areas in live (e.g., sport, work, friendship, relationship) (Moenkemeyer, 2013).



Resilience in the Organizational Context

1990s

Grzeda & Prince (1997)
Career resilience is one of 3 components of career motivation (London, 1983; Noe, Noe, & Bachhuber, 1990).
Career resilience is defined as the ‘ability to bounce back after a career setback’ (Grzeda & Prince, 1997: 172).

Wannberg & Banas (2000)
Resilience as a predictor of employee openness towards workplace changes.
Measured as a composite of 3 individual-difference variables - derived from cognitive adaptation theory: self-esteem, perceived control, and optimism.
Individuals with high levels of well-being during stressful life events exhibit high levels of these three resilience variables (Wanberg & Banas, 2000).

2000s

Luthans et al. (2007)
A central construct in positive psychology (Seligman & Csikszentmihalyi, 2000; Youssef & Luthans, 2007) and its application to the workplace.
Resilience is one of four constructs constituting Psychological Capital (PsyCap).
PsyCaps are positively oriented human resource strengths and psychological capacities that can be measured, developed, and effectively managed for performance improvement’ (Luthans & Church, 2002: 59).

Resilience and Innovation

Innovation Failure

Problem:

Possible negative influence on team members & leaders (Balachandra et al., 1996; Välikangas, Hoegl & Gibbert, 2009):

- Frustration, Anger, Disappointment
- Loss of Face
- Cynicism …

Need:

Future innovation projects need individuals with (Powley 2009; Verona 1999):

- Motivation
- Commitment
- Innovative Behavior …

MOTIVATION
SOMETIMES THERE JUST ISN'T ANY.

Need for RESILIENCE

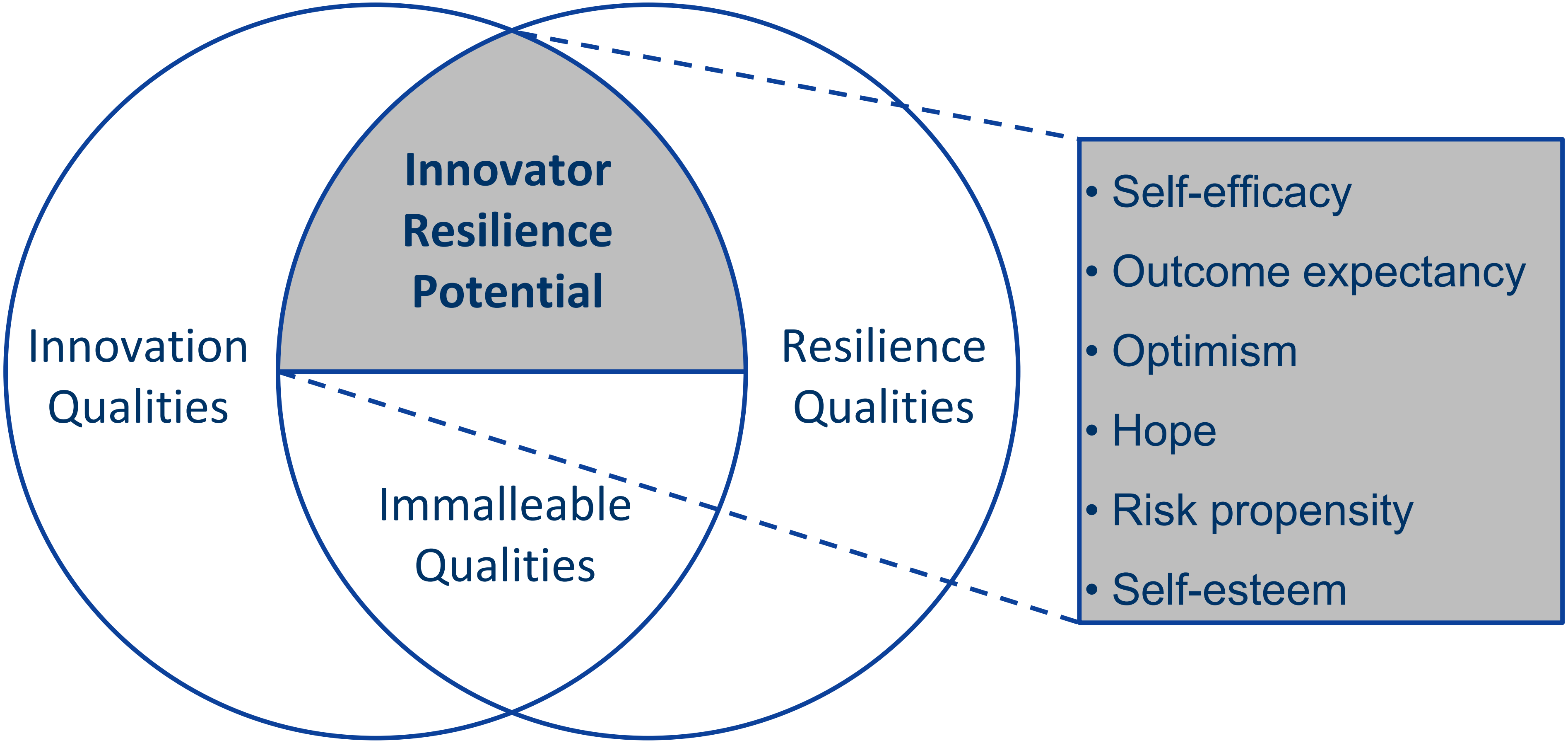
Innovator Resilience Potential – Definition

Innovator resilience potential is the "potential for future innovative functioning and coping with future setbacks"

(Moenkemeyer et al., 2012)

*Adapted from Sutcliffe & Vogus (2003)

Innovator Resilience Potential

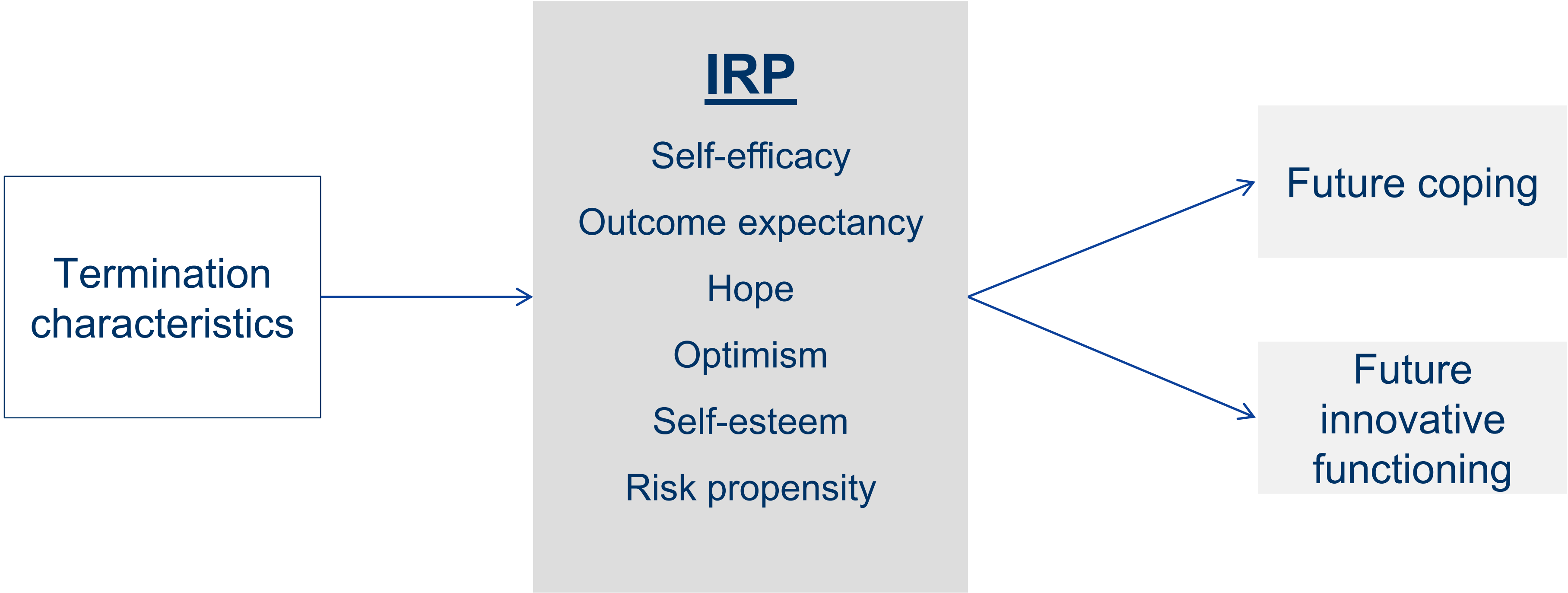


- Self-efficacy
- Outcome expectancy
- Optimism
- Hope
- Risk propensity
- Self-esteem

Definitions – IRP Factors

Self-efficacy	“Is concerned with judgments of how well one can execute courses of action required to deal with prospective situations” (Bandura, 1982: 122) - or more specific for successfully performing one’s job (Riggs & Night, 1994).
Outcome expectation	“Is a judgment of the likely consequence such performances will produce.” (Bandura, 1997: 21)
Optimism	“A mood or attitude associated with an expectation about the social or material future – one which the evaluator regards as socially desirable, to his [or her] advantage, or his [or her] pleasure” (Tiger, 1979: 18).
Hope	“Is defined as a cognitive set that is based on a reciprocally derived sense of successful: (a) agency (goal-directed determination) and (b) pathways (planning to meet goals)” (Synder et al., 1991: 570-571).
Self-esteem	Relates to judgments of self-worth respectively to liking or disliking oneself (Bandura, 1997; Braden, 1998).
Risk propensity	“Calculated actions to make effective decisions that promote goal attainment with the clear recognition of the potential of damage, setbacks, and other losses” (Tjosvold & Yu, 2007: 655).

The Resilience Cycle



Termination characteristics

IRP

Self-efficacy

Outcome expectancy

Hope

Optimism

Self-esteem

Risk propensity

Future coping

Future innovative functioning

Innovator Resilience – Protective Factors

Supporting innovator resilience during and after setbacks through external support mechanism (Moenkemeyer et al., 2012, 2013):

1) Most important is **emotional** support

2) Most effective sources of support correspond to the **source of the “stressor”**

- **Leaders & co-workers: Emotional support.**

  Acknowledge the need for support, give the possibility to show emotions (e.g., informal meetings)

  Leaders: be accessible and visible, recognize project members as (important) individuals, give constructive (timely & specific) feedback

- **Organization: Climate of safety.**

  Encouraging risk taking, celebrating “successful failures” (e.g., giving awards), recognition of individual/team performance

Debriefing / After Event Review

"Sir! I've been debriefed as ordered, Sir!"

Adequate Setting

Provide a safe and agreeable atmosphere

Reasons

Provide open information about the reasons for the termination and contributing factors

Feelings

Provide room for safely expressing feelings and worries

Analyze – Savings & Learnings

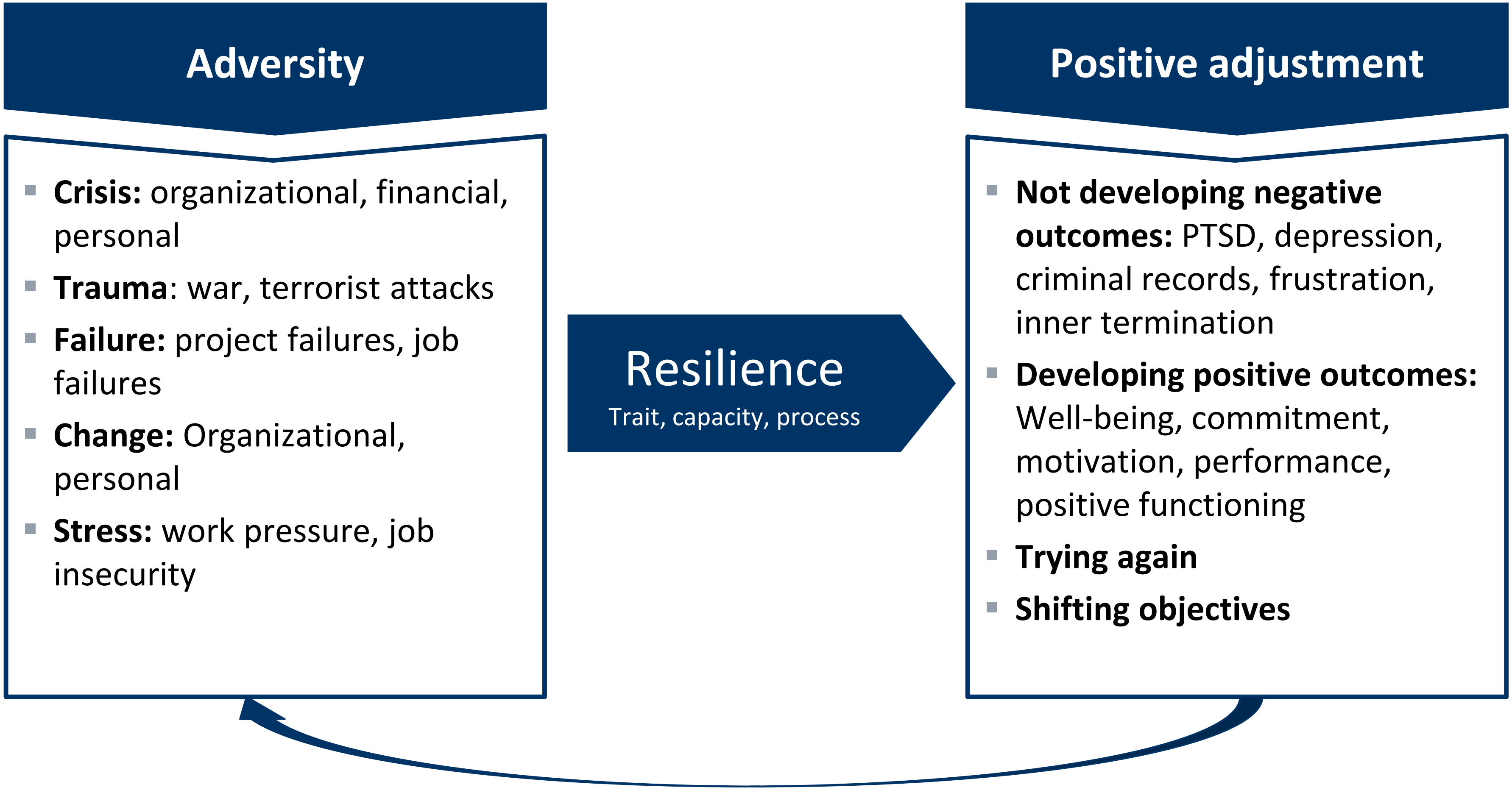
Thoroughly analyze the project

1) What can you **reuse and save** from the project
2) What can you **learn** form the project

Emotions: Broaden-and-Build Theory

Building of resilience	Positive emotions “both broaden the individuals’ momentary thought-action repertoire, and in turn build the individual’s enduring personal resources” such as physical, intellectual, social and psychological resources (Fredrickson, 2001). → **Resilience is a resource that is strengthened by positive emotions**
Undoing effect	Positive emotions ‘undo’ the effects of negative emotions (e.g., induced by a termination) and function as antidotes thereof (Fredrickson, 1998, 2001).
Broad-minded coping	Positive emotions foster broad-minded coping, which again furthers positive emotions and thus activates an upward spiral (Tugade et al., 2004).
Feeling of safety & care	Feelings of safety and care (e.g., climate of safety) induce positive emotions (Fredrickson, 1998) that foster resilience (Cohn et al., 2009; Fredrickson, 2001).

Resilience, Adversity & Positive Adjustment



Adversity

- **Crisis:** organizational, financial, personal
- **Trauma**: war, terrorist attacks
- **Failure:** project failures, job failures
- **Change:** Organizational, personal
- **Stress:** work pressure, job insecurity

Resilience

Trait, capacity, process

Positive adjustment

- **Not developing negative outcomes:** PTSD, depression, criminal records, frustration, inner termination
- **Developing positive outcomes:** Well-being, commitment, motivation, performance, positive functioning
- **Trying again**
- **Shifting objectives**

*adjusted from Kossek & Perregino (2016)

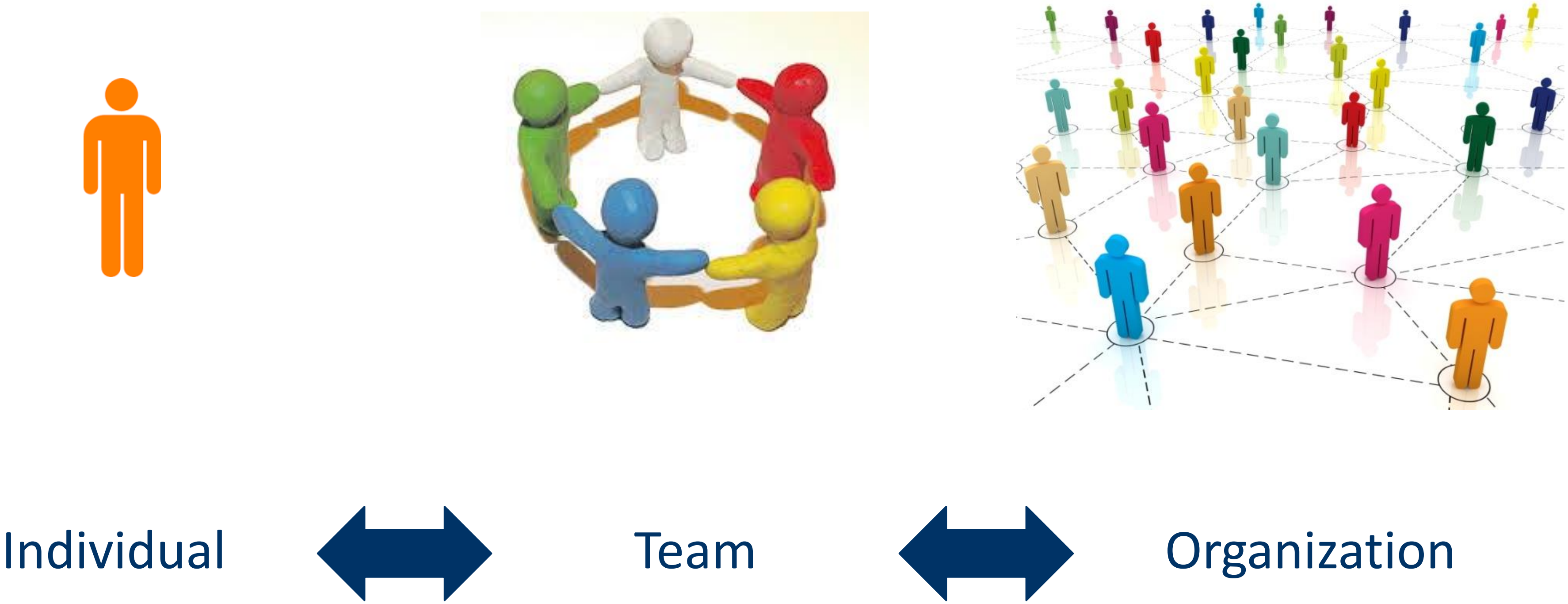
Interaction – Theories & Research Fields

“Resiliency is a metatheory that encompasses, many theories, from Piaget to Kohlberg” (Richardson 2002: 311).

There is a large interrelation between resilience and other research fields such as coping, salutogenesis, stress recovery and learning from failure.

Stress recovery	“The process of reducing or eliminating physical and psychological strain symptoms that have been caused by job demands and stressful events at work” (Sonnentag & Fritz, 2015).
Coping	“Cognitive and behavioral efforts to master, reduce, or tolerate the internal and/or external demands that are created by the stressful transaction” (Folkman, 1984: 843).
Learning from failure	The extent to which a person or team “reflects upon the problems and errors it experiences, interprets and makes sense of why they occurred […] to produce improved outcomes” (Carmeli et al., 2012: 33).
Salutogenesis	Defined by WHO as “the process of enabling people to increase control over, and to improve, their health and thereby enabling people lead an active productive life towards wellbeing and quality of life” (Ottawa Charter for Health Promotion, 1986).

Resilience Systems



Individual ⟷ Team ⟷ Organization

Team resilience is more than the sum of individual resilience, organizational resilience is more than the sum of team resilience …

References

Alliger, G., Cerasoli, C., Tannenbaum, S., & Vessey, W. 2015. Team resilience: How teams flourish under pressure. ***Organizational Dynamics***, *44*, 176-184.

Amabile, T. 2000. Stimulate creativity by fueling passion. In E. A. Locke (Ed.), ***The Blackwell Handbook of Principles of Organizational Behavior***, Vol. 1: 331-341.

Balachandra, R. 1984. Critical signals for making Go/NoGo decisions in new product development. ***Journal of Product Innovation Management***, *1*(2), 92-100.

Balachandra, R., Brockhoff, K., & Pearson, A. 1996. R&D project termination decisions: Processes, communication, and personnel changes. ***Journal of Product Innovation Management***, *13*(3), 245-256.

Bandura, A. 1982. Self-efficacy mechanism in human agency. ***American Psychologist***, *37*(2), 122-147.

Bandura, A. 1997. ***Self-efficacy: The exercise of control***. New York, NY, U.S.: Freeman.

Benson, P.1997. ***All kids are our kids***. Minneapolis, MN, U.S.: Search Institute.

Block, J. 1982. Assimilation, accommodation, and the dynamics of personality development. ***Child Development***, *53*(2), 281-295.

Block, J., & Kremen, A.1996. IQ and ego-resiliency: Conceptual and empirical connections and separateness. ***Journal of Personality and Social Psychology***, *70*(2), 349-361.

Bonanno, G. 2004. Loss, trauma, and human resilience: Have we underestimated the human capacity to thrive after extremely aversive events? ***American Psychologist***, *59*(1), 20-28.

References *(cont.)*

Bonanno, G., Gales, S., Bucciarelli, A., & Vlahov, D. 2006. Psychological Resilience After Disaster – New York City in the Aftermath of the September 11th Terrorist Attack. ***Psychological Science***, *17*(3), 181-186.

Braden, N. 1998. ***Self-esteem at work***. San Francisco, CA, U.S.: Jossey-Bass.

Campbell-Sills, L., & Stein, M. 2007. Psychometric analysis and refinement of the Connor-Davidson Resilience Scale (CD-RISC): Validation of a 10-item measure of resilience. ***Journal of Traumatic Stress***, *20*(6).

Carmeli, A., Friedman, Y., & Tishler, A. 2013. Cultivating a resilient top management team: The importance of relational connections and strategic decision comprehensiveness. ***Safety Science***, *51*, 148-159.

Carmeli, A., Tishler, A., & Edmondson, A. 2012. CEO relational leadership and strategic decision quality in top management teams: The role of team trust and learning from failure. ***Strategic Organization***, *10*(1), 31-54.

Cohn, M., Fredrickson, B., Brown, S., Mikels, J., & Conway, A. 2009. Happiness unpacked: Positive emotions increase life satisfaction by building resilience. ***Emotion***, *9*(3), 361-368.

Connor, K. M., & Davidson, J. R. T. 2003. Development of a new resilience scale: The Connor-Davidson resilience scale (CD-RISC). ***Depression and Anxiety***, *18*(2), 76-82.

Ernst, H. 2002. Success factors of new product development: A review of the empirical literature. ***International Journal of Management Reviews***, *4*(1).

References *(cont.)*

Fredrickson, B. 1998. What good are positive emotions? ***Review of General Psychology***, *2*(3), 300-319.

Fredrickson, B. 2001. The role of positive emotions in positive psychology: The broaden-and-build theory of positive emotions. ***American Psychologist***, *56*(3), 218-226.

Folkman, S. 1984. Personal Control and Stress and Coping Processes: A Theoretical Analysis. ***Journal of Personality and Social Psychology***. *46*(4): 839-852.

Hoegl, M., Weinkauf, K., & Gemuenden, H. 2004. Interteam coordination, project commitment, and teamwork in multiteam R&D projects: A longitudinal study. ***Organization Science***, *15*(1), 38-55.

Garmezy, N. 1991. Resiliency and vulnerability to adverse developmental outcomes associated with poverty. ***American Behavioral Scientist***, *34*, 416-430.

Garmezy, N., Masten, A., & Tellegen, A. 1984. The study of stress and competence in children: A building block for developmental psychopathology. ***Child Development***, *55*, 97-111.

Gourville, J. 2006. Eager sellers & stony buyers. ***Harvard Business Review***, *84*(6), 98-106.

Grzeda, M., & Prince, J. 1997. Career motivation measures: A test of convergent and discriminant validity. ***International Journal of Human Resource Management***, *8*(2), 172-196.

Luthans, F., Youssef, C., & Avolio, B. 2007. Psychological capital developing the human competitive edge. New York, NY, U.S.: Oxford University Press.

Luthar, S., & Cicchetti, D. 2000. The construct of resilience: Implications for interventions and social policies. ***Development and Psychopathology***, *12*(4), 857-885.

References *(cont.)*

Luthar, S., Cicchetti, D., & Becker, B. 2000. The construct of resilience: A critical evaluation and guidelines for future work. ***Child Development***, *71*(3), 543-562.

Masten, A., & Obradovic, J. 2006. Competence and resilience in development. ***Annals of the New York Academy of Sciences***, *1094*, 13-27.

McDonough, E. 2000. An investigation of factors contributing to the success of cross-functional teams. ***Journal of Product Innovation Management***, *17*(3), 221-235.

McGrath, R., Keil, T., & Tukiainen, T. 2006. Extracting value from corporate venturing. ***MIT Sloan Management Review***, *48*(1), 50-56.

Morgan, P., Fletcher, D., & Sarkar, M. 2015. Understanding team resilience in the world's best athletes: A case study of a rugby union World Cup winning team. ***Psychology of Sport and Exercise***, *16*, 91-100.

Oeij, P., Dhondt, S., Gaspersz, J., & de Vroome, E. 2016. Can teams benefit from using a mindful infrastructure when defensive behavior threatens complex innovation projects? ***International Journal of Project Organization and Management***, *8*(3), 241-258.

Powley, E. 2009. Reclaiming resilience and safety: Resilience activation in the critical period of crisis. ***Human Relations***, *62*(9), 1289-1326.

Reichvich, K., & Shatté, A. 2002. The resilience factor: 7 keys to finding your inner strength and overcoming life's hurdles – The Resilience Factor. BroadwayBooks.

Riggs, M., & Knight, P. 1994. The impact of perceived group success-failure on motivational beliefs and attitudes: A causal model. ***Journal of Applied Psychology***, *79*(5), 755-766.

References *(cont.)*

Richardson, G. 2002. The metatheory of resilience and resiliency. ***Journal of Clinical Psychology***, *58*(3), 307-321.

Rodríguez-Sánchez, A., & Perea, M. 2015. The secret of organization success. ***International Journal of Emergency Services***, *4*(1), 27-36.

Rutter, M. 1979. Protective factors in children's responses to stress and disadvantages. In M. W. Kent & I. E. Rolf (Eds.), ***Primary prevention of psychopathology***, Vol. 3.: 49-74, Hanover, NH, U.S.: University Press of New England.

Rutter, M. 1985. Resilience in the face of adversity: Protective factors and resistance to psychiatric disorder. ***British Journal of Psychiatry***, *47*, 598-611.

Shepherd, D., Covin, J., & Kuratko, D. 2009. Project failure from corporate entrepreneurship: Managing the grief process. ***Journal of Business Venturing***, *24*(6), 588-600.

Snyder, C., Harris, C., Anderson, J., Holleran, S., Irving, L., Sigmon, S., Yoshinobu, L., Gibb, J., Langelle, C., & Harney, P. 1991. The will and the ways: Development and validation of an individual-differences measure of hope. ***Journal of Personality and Social Psychology***, *60*(4), 570-585.

Sonnentag, S., & Fritz, C. 2015. Recovery from job stress: The stressor-detachment model as an integrative framework. ***Journal of Organizational Behavior***, *36*(S1), S72-S103.

Sutcliffe, K., & Vogus, T. 2003. Organizing for resilience. In K. S. Cameron, J. E. Dutton, & R. E. Q. Quinn (Eds.), ***Positive organizational scholarship: Foundations of a new discipline***, 94-110. San Francisco, CA, U.S.: Berrett-Koehler.

References *(cont.)*

Tiger, L. 1979. ***Optimism: The biology of hope***. New York, NY, U.S.: Simon & Schuster.

Tjosvold, D., & Ziyou, Y. 2007. Group risk taking. ***Group & Organization Management***, *32*(6), 653-674.

Tugade, M., & Fredrickson, B. 2004. Resilient individuals use positive emotions to bounce back from negative emotional experiences. ***Journal of Personality & Social Psychology***, *86*(2), 320-333.

Tugade, M., Fredrickson, B., & Feldman Barrett, L. 2004. Psychological resilience and positive emotional granularity: Examining the benefits of positive emotions on coping and health. ***Journal of Personality***, *72*(6), 1161-1190.

Välikangas, L., Hoegl, M., & Gibbert, M. 2009. Why learning from failure isn't easy (and what to do about it): Innovation trauma at Sun Microsystems. ***European Management Journal***, *27*(4), 225-233.

Verona, G. 1999. A resource-based view of product development. ***Academy of Management Review***, *24*(1), 132-142.

Wanberg, C. R., & Banas, J. T. 2000. Predictors and outcomes of openness to changes in a reorganizing workplace. ***Journal of Applied Psychology***, *85*(1), 132-142.

Werner, E.1982. ***Vulnerable but invincible: A longitudinal study of resilient children and youth***. New York, NY, U.S.: McGraw-Hili.

Werner, E., & Smith, R. 1992. ***Overcoming the odds: High risk children from birth to adulthood***. Ithaca, NY, U.S.: Cornell University Press.

Prof. Dr. Stefan Razinskas
School of Business and Economics | Department of Management

The Human Side of Innovation Projects

Session 5:

Innovation from an individual-level perspective

No copying, photographing, video recording allowed.

© Prof. Dr. Stefan Razinskas. School of Business and Economics | Department of Management | FU Berlin. All rights reserved.

The recording and duplication of a course or its contents, e.g., slides or presentations, are prohibited for copyright and data protection reasons. Courses and contents thereof may not be distributed in whole or in part without authorization, especially not on the internet or in social networks. Insofar as personal data is processed, the relevant data protection regulations must be observed. The courses and contents are intended exclusively for educational purposes. Violations of any kind, in particular unauthorized recording of courses or contents, unauthorized use or distribution of courses or contents, violations of personal rights, illegal and improper data processing, manipulation of courses or contents, or disclosure of user IDs or passwords, will be prosecuted and punished.

To order copies or request permission to reproduce materials, e-mail stefan.razinskas@fu-berlin.de.

Recap: Resilience & Innovation

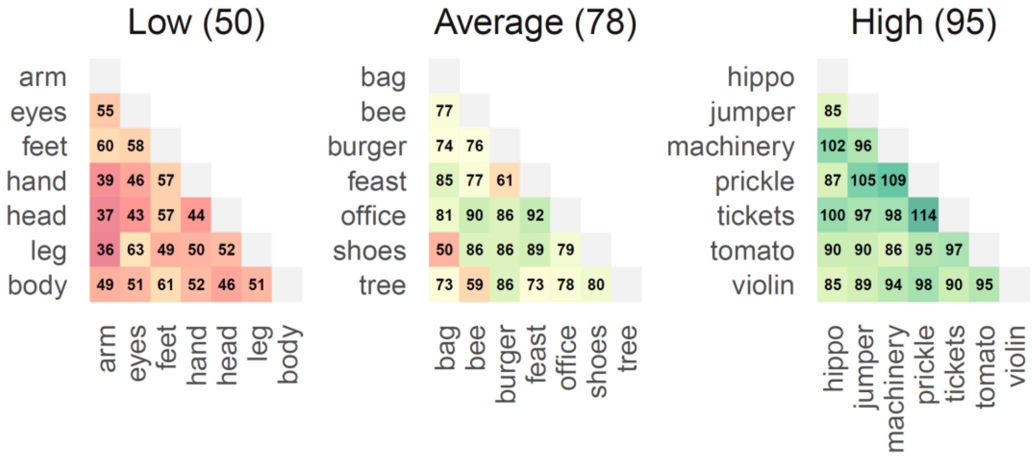
- The importance of resilience for innovation
  - Most innovative endeavors fail.
  - Failure is likely to impair motivation for future innovative activities.
- The nature of resilience
  - Core concept in positive psychology / positive OB.
  - Resilience vs. robustness.
  - Process vs. trait.
  - Resilience vs. resiliency / resilience potential.
- Supporting resilience in organizations
  - Social support from the context of the failure.
  - Post-termination debriefings.

Your Divergent Thinking

Source: https://www.datcreativity.com/

The Divergent Association Task (DAT)

- Higher DAT scores indicate larger semantic distances between each pair of words.



Low (50)

	arm	eyes	feet	hand	head	leg	body
arm							
eyes	55						
feet	60	58					
hand	39	46	57				
head	37	43	57	44			
leg	36	63	49	50	52		
body	49	51	61	52	46	51	

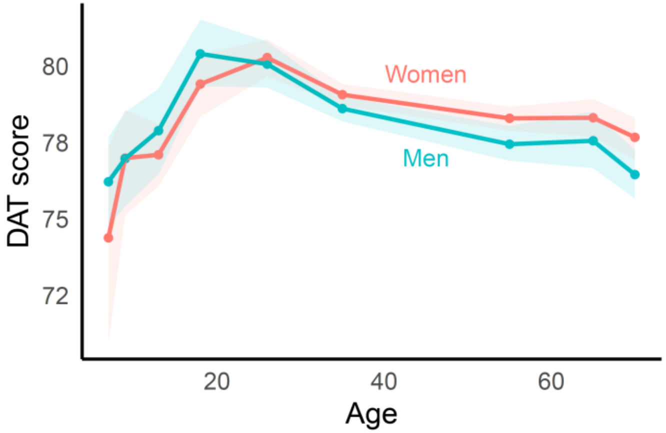
Average (78)

	bag	bee	burger	feast	office	shoes	tree
bag							
bee	77						
burger	74	76					
feast	85	77	61				
office	81	90	86	92			
shoes	50	86	86	89	79		
tree	73	59	86	73	78	80	

High (95)

	hippo	jumper	machinery	prickle	tickets	tomato	violin
hippo							
jumper	85						
machinery	102	96					
prickle	87	105	109				
tickets	100	97	98	114			
tomato	90	90	86	95	97		
violin	85	89	94	98	90	95	

- DAT scores by age and gender, with women showing slightly higher overall scores than men.



Source: Olson et al. (2021)

Let’s Talk About…

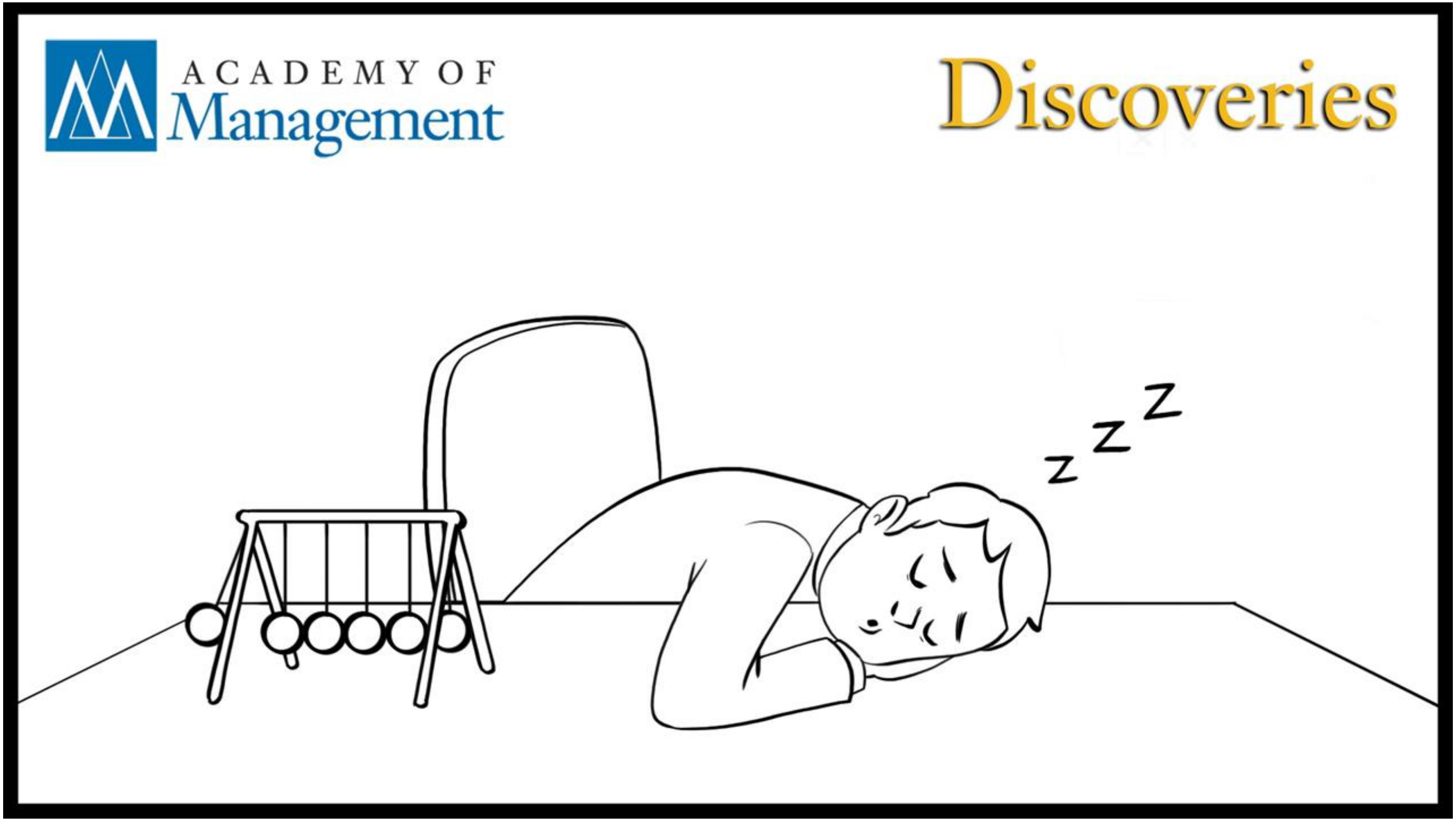
The Role of Boredom for Life in General

- Boredom has notable disruptive and harmful consequences.
- Some argue that feeling bored is one of the main causes of violence:
  - Bored individuals seek more thrill and risks (Baumeister, 1999; Baumeister & Campbell, 1999).
  - Shoplifting provided criminals arousal and enjoyment to ease their boredom (Katz, 1988).
  - When feeling bored, individuals more likely engage in sabotage and deviant behaviors (Fisher, 1993), or in physical and verbal aggression toward others (Joireman et al., 2003).
- Boredom at work may increase…
  - … alcohol consumption and work stress (Wiesner et al., 2005) and
  - … employees' likelihood to be absent from work and/or leave their organization altogether (Kass et al., 2001; Van Hooff & van Hooft, 2017).

The Role of Boredom for Creativity

- However, others describe boredom as a precedent for ingenious ideas and creativity (e.g., Csikszentmihalyi, 1975):
  - Boredom triggers curiosity in individuals and facilitates learning and the exploration of new ideas (Lewin, 1951).
  - It can be a potential source of balance and creativity (Suedfeld, 1975).
  - Bored individuals are often motivated to seek challenges or stimulation in a positive manner (Farmer & Sundberg, 1986).
- Park and colleagues (2019) have recently shown that boredom…
  - … helps boost individual productivity on an idea-generation task,
  - … may increase creativity because it does not involve negative activating emotions (i.e., anger and frustration), and
  - ... only benefits the creativity of individuals with high learning goal orientation, need for cognition, openness to experience, and internal locus of control.

The (Surprising) Truth About Boredom



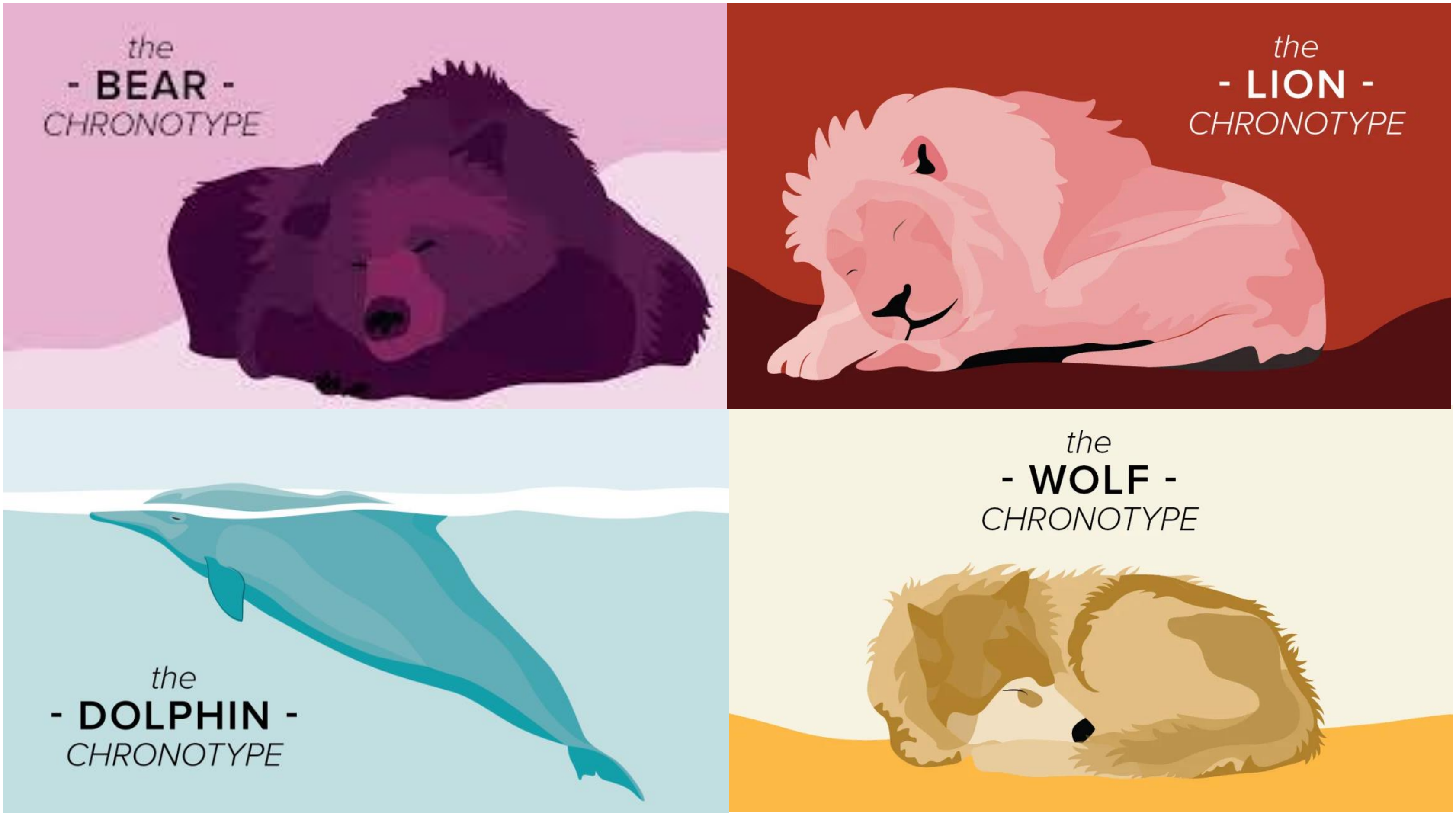
Source: https://www.youtube.com/watch?v=c-bw9Abx3z8

Have You Been Bored Enough?

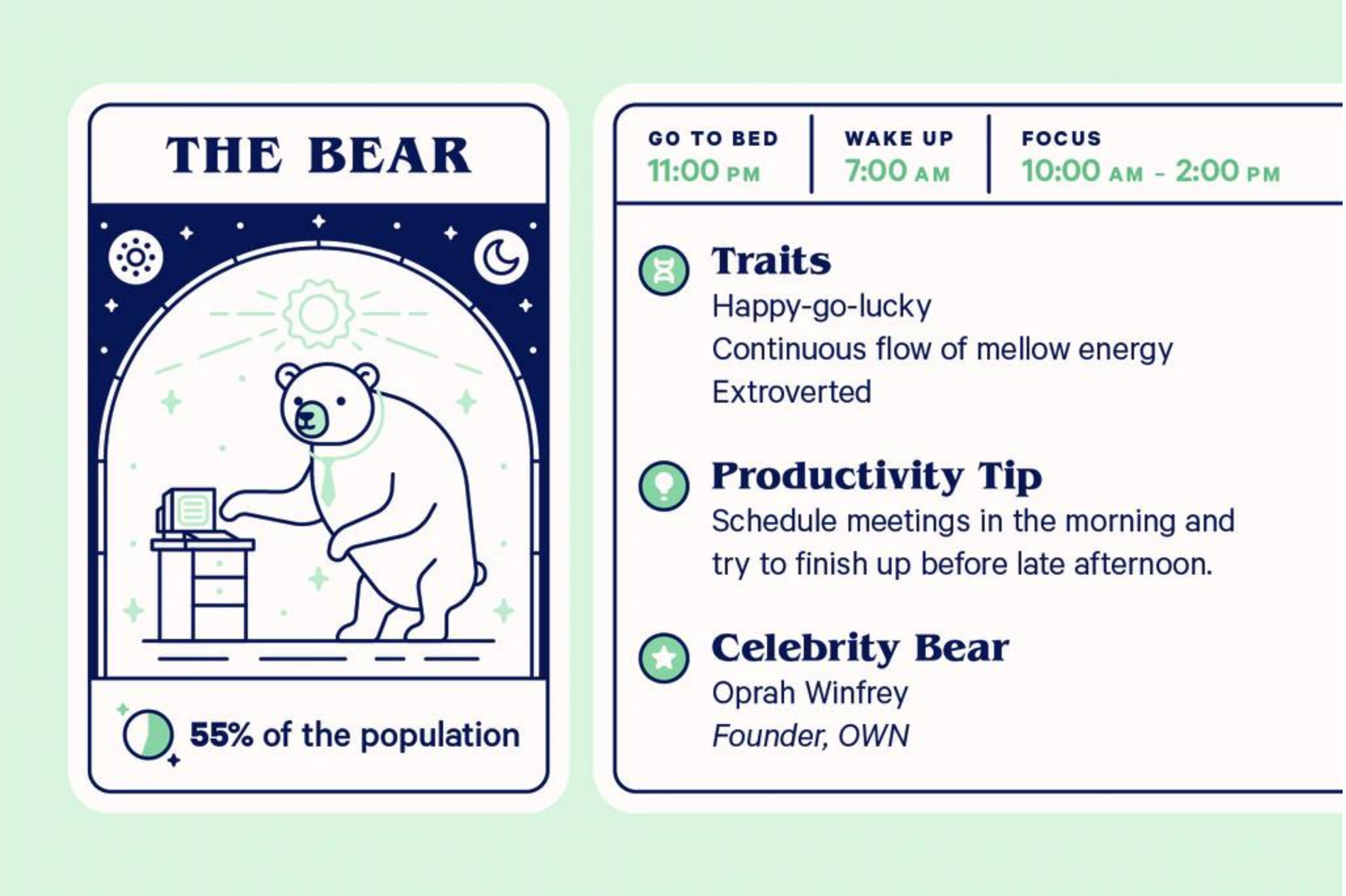
Source: https://www.datcreativity.com/

Bionics?

Chronotypes!



The Bear



THE BEAR

55% of the population

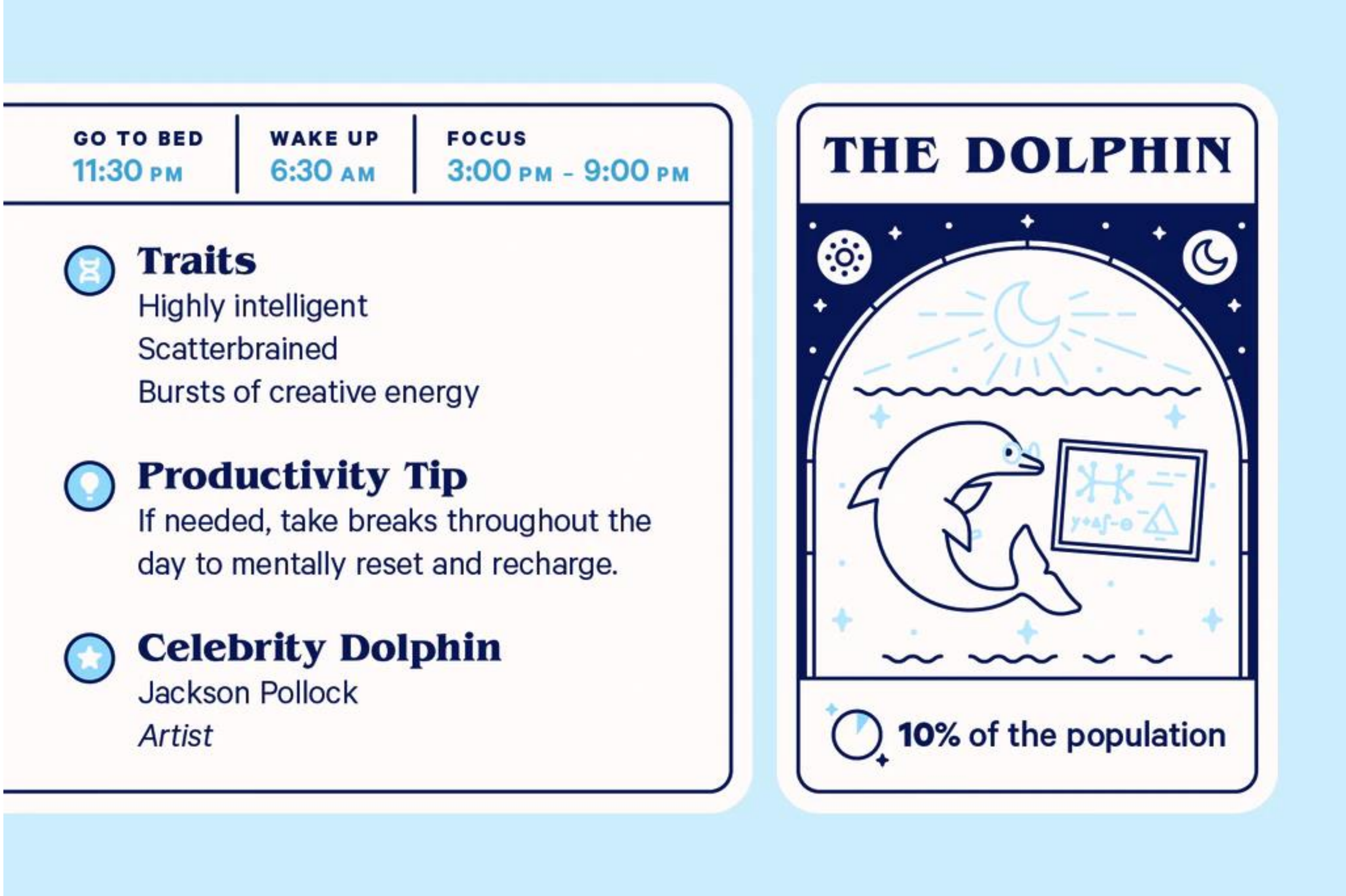
GO TO BED	WAKE UP	FOCUS
11:00 PM	7:00 AM	10:00 AM - 2:00 PM

Traits
Happy-go-lucky
Continuous flow of mellow energy
Extroverted

Productivity Tip
Schedule meetings in the morning and try to finish up before late afternoon.

Celebrity Bear
Oprah Winfrey
Founder, OWN

The Dolphin



GO TO BED 11:30 PM | **WAKE UP** 6:30 AM | **FOCUS** 3:00 PM - 9:00 PM

Traits
Highly intelligent
Scatterbrained
Bursts of creative energy

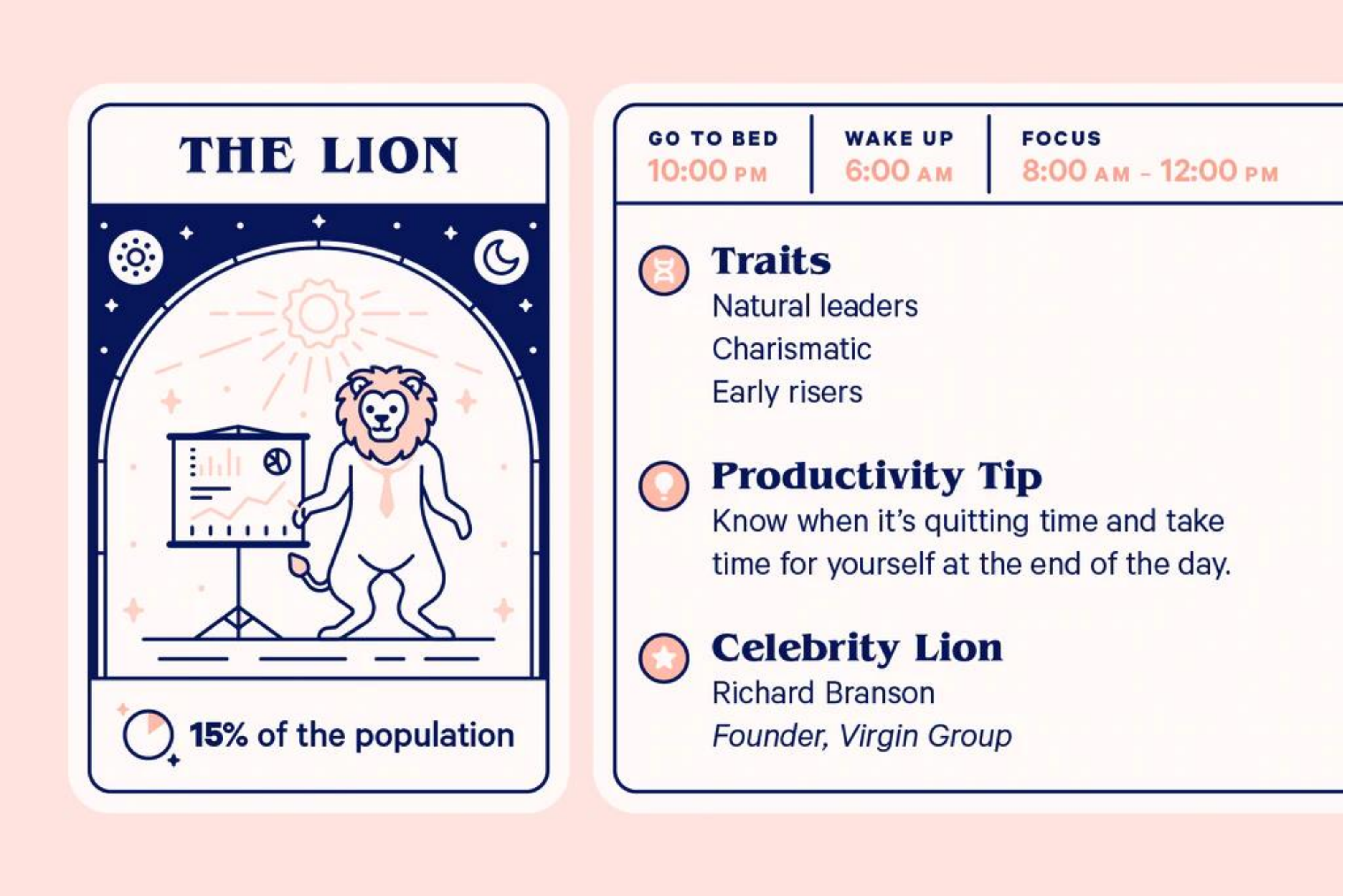
Productivity Tip
If needed, take breaks throughout the day to mentally reset and recharge.

Celebrity Dolphin
Jackson Pollock
Artist

THE DOLPHIN

10% of the population

The Lion



THE LION

15% of the population

GO TO BED	WAKE UP	FOCUS
10:00 PM	6:00 AM	8:00 AM - 12:00 PM

Traits

Natural leaders

Charismatic

Early risers

Productivity Tip

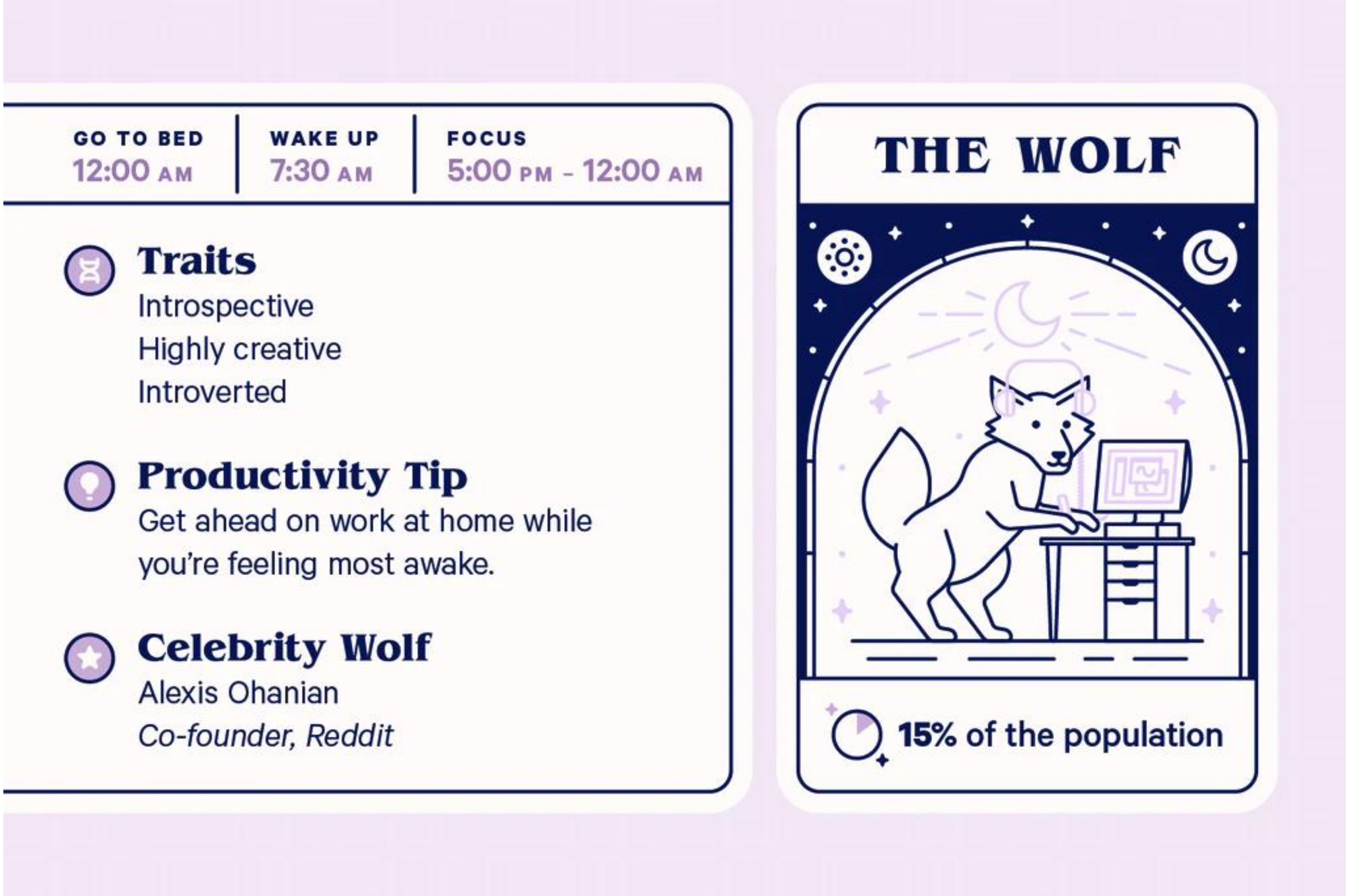
Know when it’s quitting time and take time for yourself at the end of the day.

Celebrity Lion

Richard Branson

Founder, Virgin Group

The Wolf



GO TO BED 12:00 AM | **WAKE UP** 7:30 AM | **FOCUS** 5:00 PM - 12:00 AM

Traits

Introspective
Highly creative
Introverted

Productivity Tip

Get ahead on work at home while you're feeling most awake.

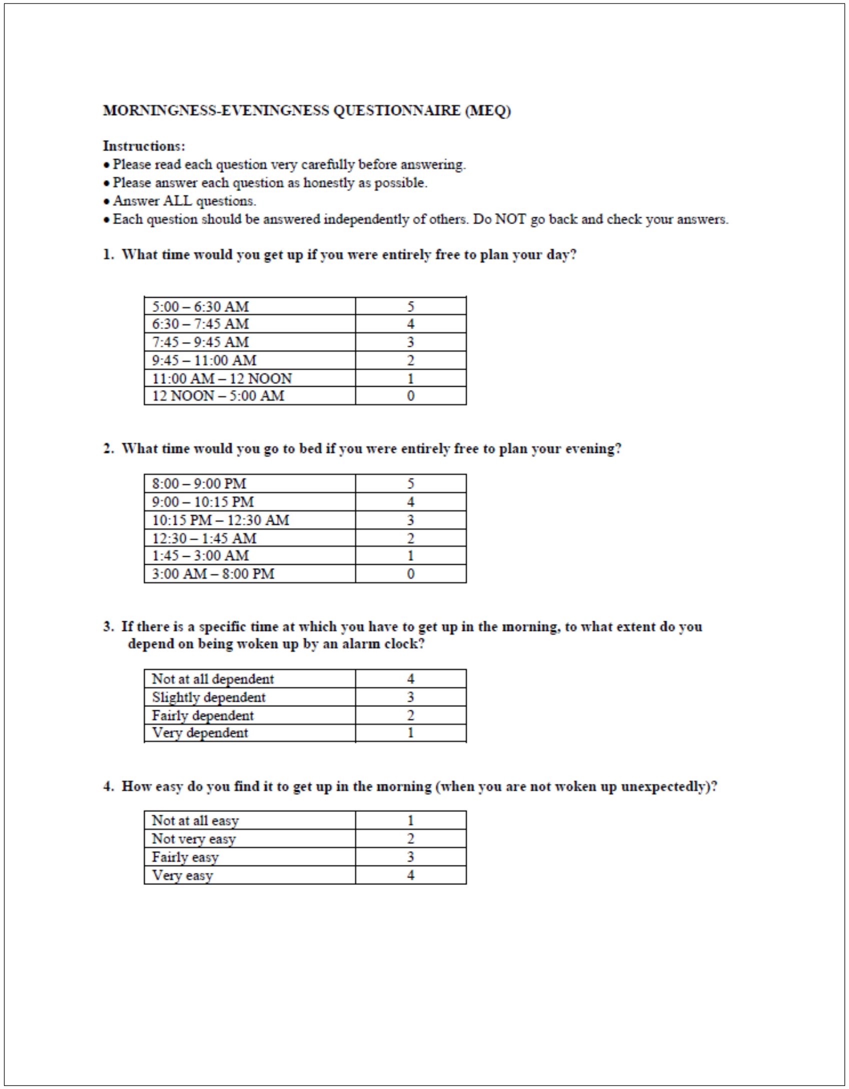
Celebrity Wolf

Alexis Ohanian
Co-founder, Reddit

THE WOLF

15% of the population

Now It’s Your Turn!



MORNINGNESS-EVENINGNESS QUESTIONNAIRE (MEQ)

Instructions:
- Please read each question very carefully before answering.
- Please answer each question as honestly as possible.
- Answer ALL questions.
- Each question should be answered independently of others. Do NOT go back and check your answers.

1. What time would you get up if you were entirely free to plan your day?

5:00 – 6:30 AM	5
6:30 – 7:45 AM	4
7:45 – 9:45 AM	3
9:45 – 11:00 AM	2
11:00 AM – 12 NOON	1
12 NOON – 5:00 AM	0

2. What time would you go to bed if you were entirely free to plan your evening?

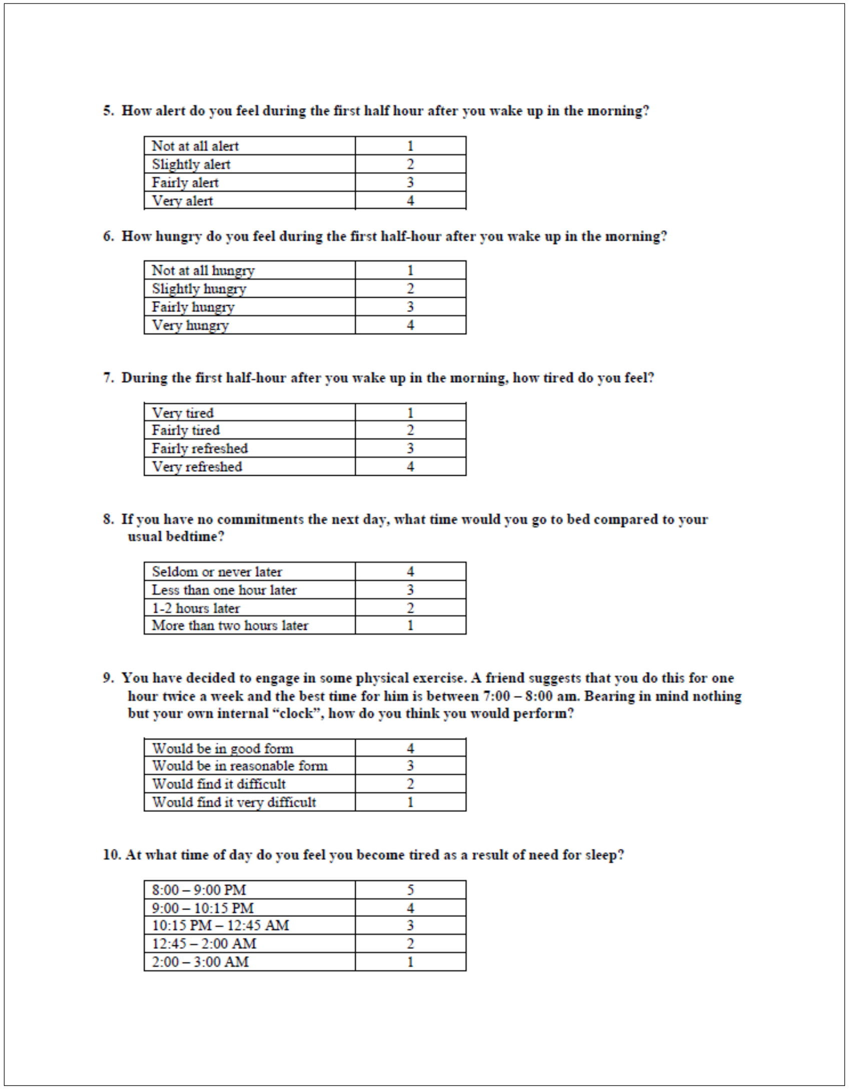
8:00 – 9:00 PM	5
9:00 – 10:15 PM	4
10:15 PM – 12:30 AM	3
12:30 – 1:45 AM	2
1:45 – 3:00 AM	1
3:00 AM – 8:00 PM	0

3. If there is a specific time at which you have to get up in the morning, to what extent do you depend on being woken up by an alarm clock?

Not at all dependent	4
Slightly dependent	3
Fairly dependent	2
Very dependent	1

4. How easy do you find it to get up in the morning (when you are not woken up unexpectedly)?

Not at all easy	1
Not very easy	2
Fairly easy	3
Very easy	4



5. How alert do you feel during the first half hour after you wake up in the morning?

Not at all alert	1
Slightly alert	2
Fairly alert	3
Very alert	4

6. How hungry do you feel during the first half-hour after you wake up in the morning?

Not at all hungry	1
Slightly hungry	2
Fairly hungry	3
Very hungry	4

7. During the first half-hour after you wake up in the morning, how tired do you feel?

Very tired	1
Fairly tired	2
Fairly refreshed	3
Very refreshed	4

8. If you have no commitments the next day, what time would you go to bed compared to your usual bedtime?

Seldom or never later	4
Less than one hour later	3
1-2 hours later	2
More than two hours later	1

9. You have decided to engage in some physical exercise. A friend suggests that you do this for one hour twice a week and the best time for him is between 7:00 – 8:00 am. Bearing in mind nothing but your own internal “clock”, how do you think you would perform?

Would be in good form	4
Would be in reasonable form	3
Would find it difficult	2
Would find it very difficult	1

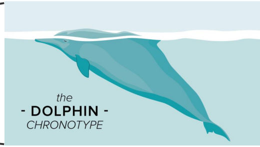
10. At what time of day do you feel you become tired as a result of need for sleep?

8:00 – 9:00 PM	5
9:00 – 10:15 PM	4
10:15 PM – 12:45 AM	3
12:45 – 2:00 AM	2
2:00 – 3:00 AM	1

The Morningness-Eveningness in Human Circadian Rhythms

- Scores on the nineteen morningness-eveningness questions by Horne & Östberg (1976) can range from 16-86.
- After adding up the points you circled, you can compare your total morningness-eveningness score with the different types:

Score	Type
70 – 86	Definitely morning type
59 – 69	Moderately morning type
42 – 58	Neither type
31 – 41	Moderately evening type
16 – 30	Definitely evening type



The Role of Chronotype for Creativity

- To be creative, individuals need…
    - … to form remote associations and integrate different sources of information so that new and useful ideas can emerge (Tadmor et al., 2012), which requires them…
    - … to switch between different categories or perspectives, integrate remotely associated information, and recombine elements in novel ways (De Dreu et al., 2011; George, 2007).
- Synchrony matters, that is, people are creative when the external clock is aligned with their internal, biological clock (Kühnel et al., 2022):
    - Early chronotypes tend to be more creative in the morning.
    - Late chronotypes tend to be more creative in the late afternoon.

When An Innovation Project Goes Wrong

Source: https://www.youtube.com/watch?v=kmJ59yyYza4

Scope Creep in Project Management

- Scope creep refers to project requirements growing uncontrollably, often dictated by a project’s stakeholder(s).
- It often starts with simple sentences like “You know what would be cool?” and ends in small changes ultimately turning into big headaches down the road.
- Common causes of scope creep in project management include:
  - Poorly defined project scope due to vagueness and lack of details.
  - Weak leadership due to lack of project management practices.
  - Addition of unnecessary features due to differing stakeholder opinions.
  - Weak communication between project stakeholders.

Freie Universität Berlin

References

Baumeister, R. F. 1999. ***Evil: Inside human violence and cruelty***. New York, NY, U.S.: Macmillan.

Baumeister, R. F., & Campbell, W. K. 1999. The intrinsic appeal of evil: Sadism, sensational thrills, and threatened egotism. ***Personality and Social Psychology Review**, 3*(3): 210–221

Csikszentmihalyi, M. 1975. ***Beyond boredom and anxiety***. San Francisco, CA, U.S.: Jossey-Bass.

De Dreu, C. K., Nijstad, B. A., & Baas, M. 2011. Behavioral activation links to creativity because of increased cognitive flexibility. ***Social Psychological & Personality Science**, 2*(1): 72–80.

Farmer, R., & Sundberg, N. D. 1986. Boredom proneness—The development and correlates of a new scale. ***Journal of Personality Assessment**, 50*(1): 4–17.

Fisher, C. D. 1993. Boredom at work: A neglected concept. ***Human Relations**, 46*(3): 395–417.

George, J. M. 2007. Creativity in organizations. ***Academy of Management Annals**, 1*(1): 439–477.

Horne, J. A., & Östberg, O. 1976. A self-assessment questionnaire to determine morningness-eveningness in human circadian rhythms. ***International Journal of Chronobiology**, 4*(2): 97–100.

Joireman, J., Anderson, J., & Strathman, A. 2003. The aggression paradox: Understanding links among aggression, sensation seeking, and the consideration of future consequences. ***Journal of Personality and Social Psychology**, 84*(6): 1287–1302.

Kass, S. J., Vodanovich, S. J., & Callender, A. 2001. State-trait boredom: Relationship to absenteeism, tenure, and job satisfaction. ***Journal of Business and Psychology**, 16(*2): 317–327.

Katz, S. B. 1988. ***Seduction of crime: Moral and sensual attractions in doing evil***. New York, NY, U.S.: Basic Books.

References *(cont.)*

Kühnel, J., Bledow, R., & Kiefer, M. 2022. There is a time to be creative: The alignment between chronotype and time of day. ***Academy of Management Journal****, 65*(1): 218–247.

Lewin, K. 1951. ***Field theory in social science***. New York, NY, U.S.: Harper & Row.

Olson, J. A., Nahas, J., Chmoulevitch, D., Cropper, S. J., & Webb, M. E. 2021. Naming unrelated words predicts creativity. ***PNAS****, 118*(25): 1–6.

Park, G., Lim, B.-C., & Oh, H. S. 2019. Why boredom might not be a bad thing after all. ***Academy of Management Discoveries****, 5*(1): 78–92.

Suedfeld, P. 1975. The benefits of boredom: Sensory deprivation reconsidered: The effects of a monotonous environment are not always negative; sometimes sensory deprivation has high utility. ***American Scientist****, 63*(1): 60–69.

Tadmor, C. T., Galinsky, A. D., & Maddux, W. W. 2012. Getting the most out of living abroad: Biculturalism and integrative complexity as key drivers of creative and professional success. ***Journal of Personality and Social Psychology****, 103*(3): 520–542.

Van Hooff, M. L. M., & van Hooft, E. A. J. 2017. Boredom at work: Toward a dynamic spillover model of need satisfaction, work motivation, and work-related boredom. ***European Journal of Work and Organizational Psychology****, 26*(1): 133–148.

Wiesner, M., Windle, M., & Freeman, A. 2005. Work stress, substance use, and depression among young adult workers: An examination of main and moderator effect model. ***Journal of Occupational Health Psychology****, 10*(2): 83–96.

Prof. Dr. Stefan Razinskas
School of Business and Economics | Department of Management

Freie Universität Berlin

The Human Side of Innovation Projects

Session 6:

Innovation in teams – Team processes

No copying, photographing, video recording allowed.

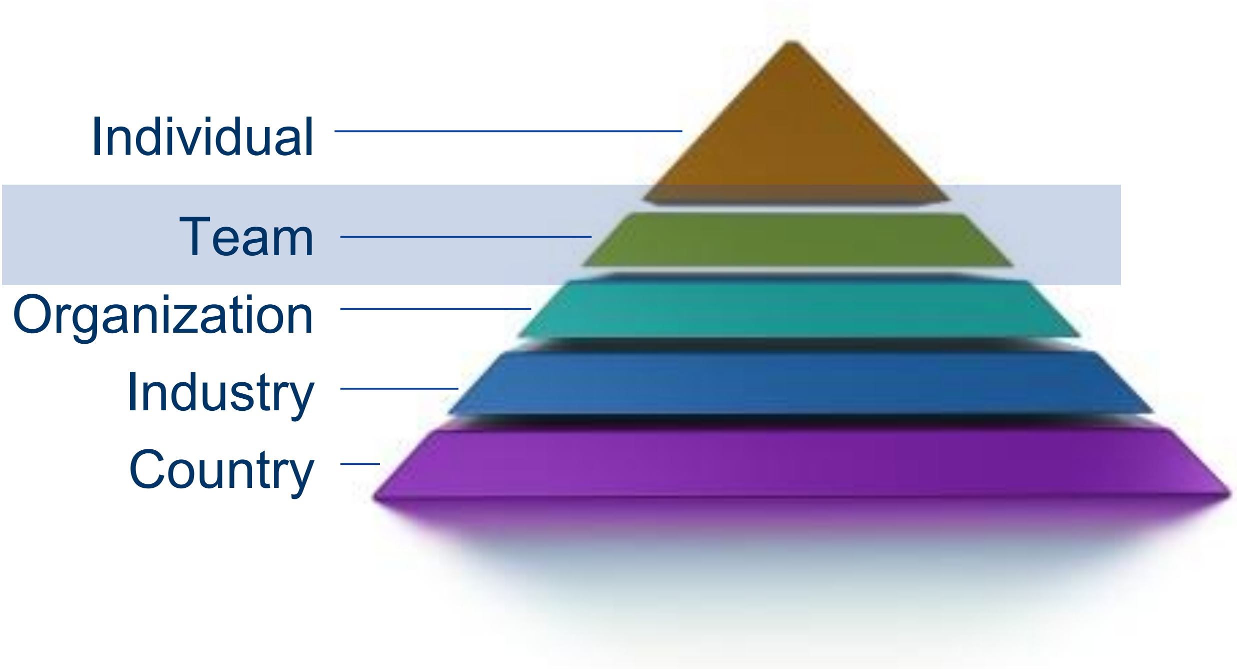
© Prof. Dr. Stefan Razinskas. School of Business and Economics | Department of Management | FU Berlin. All rights reserved.

The recording and duplication of a course or its contents, e.g., slides or presentations, are prohibited for copyright and data protection reasons. Courses and contents thereof may not be distributed in whole or in part without authorization, especially not on the internet or in social networks. Insofar as personal data is processed, the relevant data protection regulations must be observed. The courses and contents are intended exclusively for educational purposes. Violations of any kind, in particular unauthorized recording of courses or contents, unauthorized use or distribution of courses or contents, violations of personal rights, illegal and improper data processing, manipulation of courses or contents, or disclosure of user IDs or passwords, will be prosecuted and punished.

To order copies or request permission to reproduce materials, e-mail stefan.razinskas@fu-berlin.de.

Today's Session: Teams and Innovation

- The relevance of teams in innovation.
- What is different when executing innovative tasks in teams?
- What characterizes successful teamwork for innovation?



Defining Teams

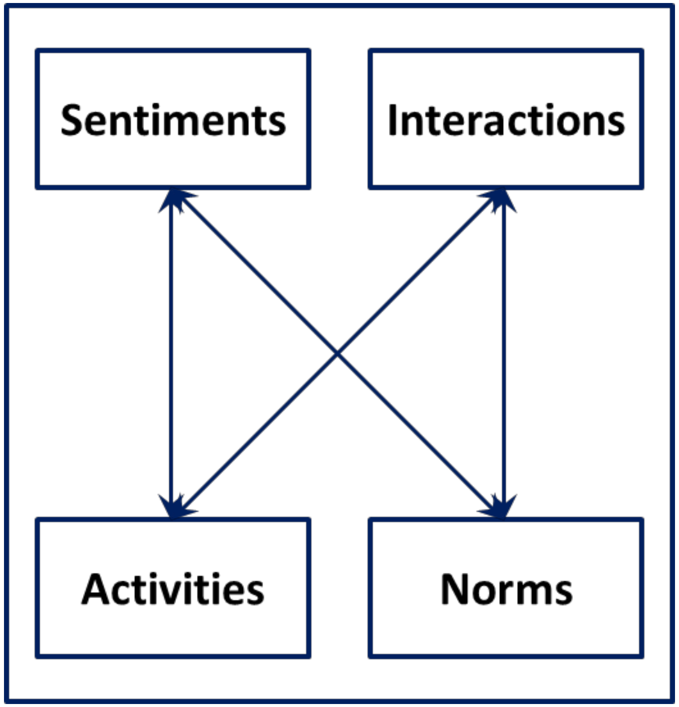
- Teams are social systems consisting of three or more persons,
    - that are embedded in an organizational context (context),
    - whose members perceive themselves to be such and are perceived by others as such (identity),
    - and that work together on a common task (teamwork).
    - Special case: Dyads.
- Teams are limited in their size:
    - Teams with more than ~10 team members tend to split up in sub-teams which, per definition, then are the actual teams.
- All teams are groups but not all groups are teams:
    - Teams vs. social groups.
    - Teams vs. identity groups.
    - Teams vs. nominal groups.

Relevance of Teams in Innovation

- Innovation in organizations is usually carried out in teams:
  - More than 70% of activities in connection with new product innovation are conducted in teams (McDonough, 2000).
  - Teams are prevalent in organizational product development (Edmondson & Nembhard, 2009).
  - Production of new knowledge in general is dominated by teams (Jones et al., 2008; Wuchty et al., 2007).
- Examples:
  - “Innovation is all about teamwork”(J. Lilliehöök, Insight Marketer Director, Electrolux).
  - ”Your work will require creativity, innovation, teamwork and leadership” (Job offer in product development, Procter & Gamble).
  - ”Efficient teamwork has a major impact on our way of thinking, in our actions and innovation processes” (Siemens AG).

Team Processes

- Homans’ theory of interpersonal processes in small groups:



Homans (1974)

Teams & Innovation

- PRO: Benefits of organizing innovative tasks in teams.
  - Teams are able to handle high complexity tasks which are too complex for individuals (Wuchty et al, 2007).
  - Teams bring together experts from different areas that enables leveraging a larger set of cognitive resources (Edmondson & Nembhard, 2009).
  - Teams enable cognitive stimulation (Dugosh et al., 2000).

Cognitive Stimulation

- Ideas generated by an individual spawn associations in the minds of other team members (Dugosh et al., 2000; Paulus, 2000).
  - Hearing ideas of other team members may activate ideas that, without some external cue, would not have been activated.
  - Consequently, individuals in a team may generate ideas that they would not have generated if they had brainstormed alone.
- Intra-team dissent/conflict as a cognitive stimulus for innovation:
  - Task conflict vs. relationship conflict!
  - Only moderate levels of task conflict associated with innovation (De Dreu, 2006).
  - Otherwise, meta-analytic findings point to negative effects of **any** conflict type on performance (De Wit et al., 2012; De Dreu & Weingart, 2003).

Teams & Innovation

- PRO: Benefits of organizing innovative tasks in teams.
  - Teams are able to handle high complexity tasks which are too complex for individuals (Wuchty et al, 2007).
  - Teams bring together experts from different areas that enables leveraging a larger set of cognitive resources (Edmondson & Nembhard, 2009).
  - Teams enable cognitive stimulation (Dugosh et al., 2000).
  - Teams enable sharing of tacit knowledge (Earl, 2001).

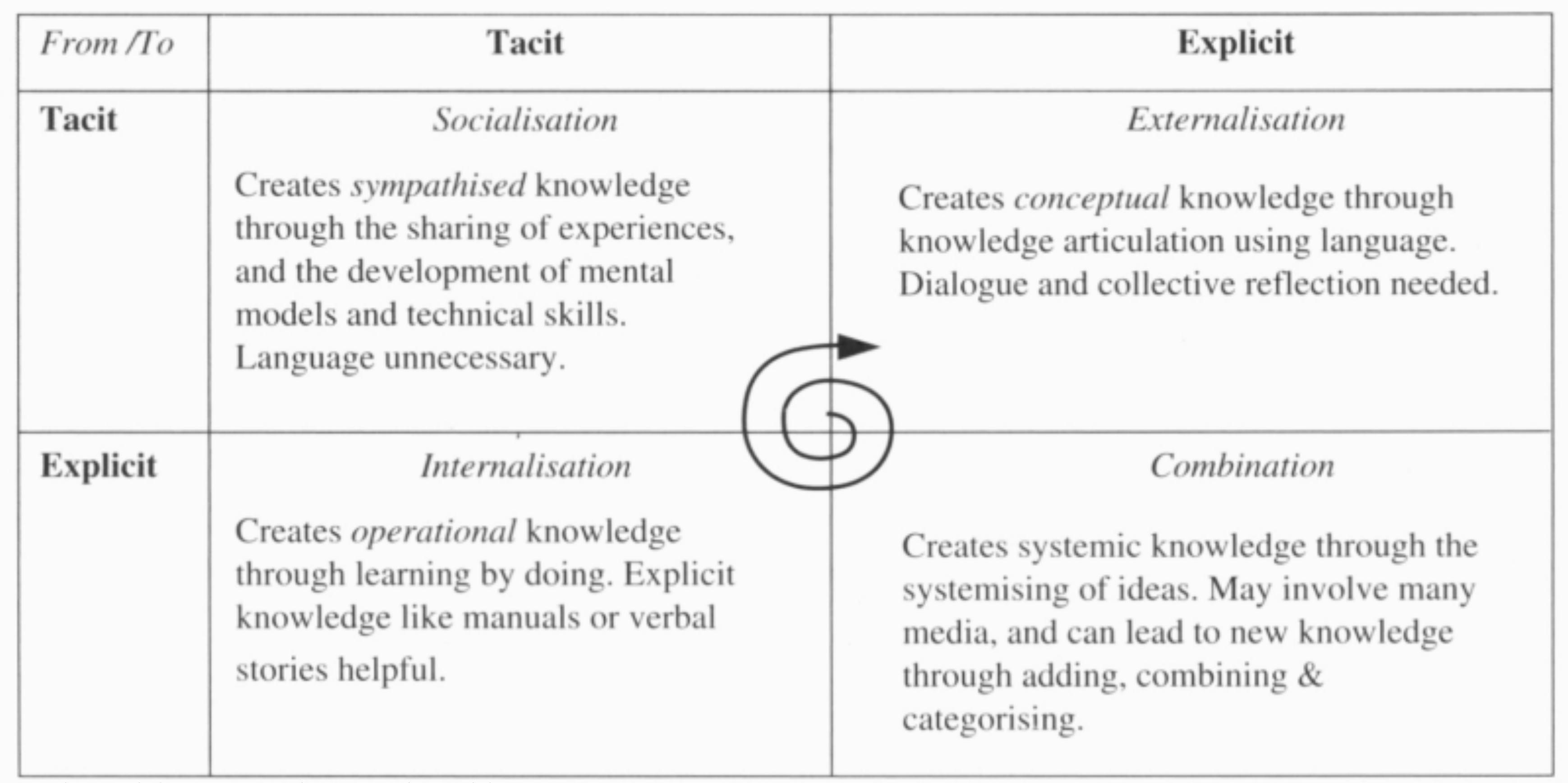
Knowledge Creation

- Two types of knowledge (Polanyi, 1966):
  - **Explicit knowledge**: Codified knowledge that is transmittable in formal, systematic language.
  - **Tacit knowledge**: Deeply rooted in action, commitment, and involvement in a specific context, which makes it hard to formalize and communicate.
- The knowledge creation process (Nonaka,1994; Nonaka&Takeuchi,1995).
- Teams enable wider participation and involvement in problem solving / idea generation:
  - Sharing of tacit knowledge.
  - Less dependence on the individual.
  - Better acceptance, commitment, and ownership of outcomes.

Knowledge Creation

- The knowledge creation process:

  (Nonaka,1994; Nonaka & Takeuchi,1995)



From /To	**Tacit**	**Explicit**
Tacit	*Socialisation* Creates *sympathised* knowledge through the sharing of experiences, and the development of mental models and technical skills. Language unnecessary.	*Externalisation* Creates *conceptual* knowledge through knowledge articulation using language. Dialogue and collective reflection needed.
Explicit	*Internalisation* Creates *operational* knowledge through learning by doing. Explicit knowledge like manuals or verbal stories helpful.	*Combination* Creates systemic knowledge through the systemising of ideas. May involve many media, and can lead to new knowledge through adding, combining & categorising.

adapted from Nonaka & Takeuchi (1995)

Teams & Innovation

- PRO: Benefits of organizing innovative tasks in teams.
  - Teams are able to handle high complexity tasks which are too complex for individuals (Wuchty et al, 2007).
  - Teams bring together experts from different areas that enables leveraging a larger set of cognitive resources (Edmondson & Nembhard, 2009).
  - Teams enable cognitive stimulation (Dugosh et al., 2000).
  - Teams enable sharing of tacit knowledge (Earl, 2001).
  - Teams are more (time) efficient through work distribution (e.g., dispersed teams) (Siebdrat et al., 2009).

Teams & Innovation

- CONTRA: Teams are NOT a natural vehicle for creativity.
  - Creativity builds on divergent thinking (Runco, 2004):
    - Requires flexible thinking in different directions.
  - BUT: Team collaborative processes produce convergent forces:
    - Groupthink (Janis, 1995).
    - Constraining influence of others' ideas (Smith, 2003).

Convergent Team Processes

- Groupthink: The strain for consensus (Janis, 1982).
  - Mode of thinking that occurs when members of a group are deeply involved in a cohesive in-group and the desire for unanimity offsets their motivation to appraise alternative courses of action.
- Effects of Groupthink (Janis, 1982; Nemeth, 1997):
  - Consideration of and focus on fewer alternatives.
  - Tendency to focus on the issue solely from the perspective of the majority or the leader.
  - Failure to perceive non-obvious risks and drawbacks of an alternative.
  - Rejection of expert opinions.
  - Ignoring potential for setbacks or actions of competitors in not developing contingency plans.

Convergent Team Processes

- Constraining influence of others' ideas
  - Path of least resistance (Ward, 1994), caused by three main triggers:
    - Typical thinking (Wiley, 1998, Hecht & Proffitt, 1995).
    - Implicit assumptions (Smith, 2003).
    - Recent experience (Smith et al., 1993).
  - Memory blocks (Smith, 2003):
    - Negative priming: Recent experience serves to block existing memories / solution approach.
    - Biased retrieval set: Retrieval of a memory / solution approach increases the subsequent likelihood of retrieving it or something similar again.
  - Experimental evidence (Luchins & Luchins, 1972; Smith & Tindell, 1997; Jansson & Smith, 1991).

Teams & Innovation

- CONTRA: Teams are NOT a natural vehicle for creativity.
  - Creativity builds on divergent thinking (Runco, 2004):
    - Requires flexible thinking in different directions.
  - BUT: Team collaborative processes produce convergent forces:
    - Groupthink (Janis, 1995).
    - Constraining influence of others' ideas (Smith, 2003).
  - Productivity losses in groups:
    - Social loafing (Karau & Williams, 1993; Murphy et al., 2003).

Social Loafing

- The tendency of individuals to expend less effort when working in a group than when working individually (Karau & Williams, 1993).
  - The "Ringelmann Effect".
- Underlying problems:
  - Diminishing transparency of individuals' contributions.
  - Diffused responsibility for completing the task.
  - Individuals believe their contribution is dispensable and not needed for group success.
- Social loafing increases as group size increases and transparency decreases.

Teams & Innovation

- CONTRA: Teams are NOT a natural vehicle for creativity.
  - Creativity builds on divergent thinking (Runco, 2004):
    - Requires flexible thinking in different directions.
  - BUT: Team collaborative processes produce convergent forces:
    - Groupthink (Janis, 1995).
    - Constraining influence of others' ideas (Smith, 2003).
  - Productivity losses in groups:
    - Social loafing (Karau & Williams, 1993; Murphy et al., 2003).
    - Production blocking (Diehl & Stroebe, 1991; Nijstad & Stroebe, 2006).

Production Blocking

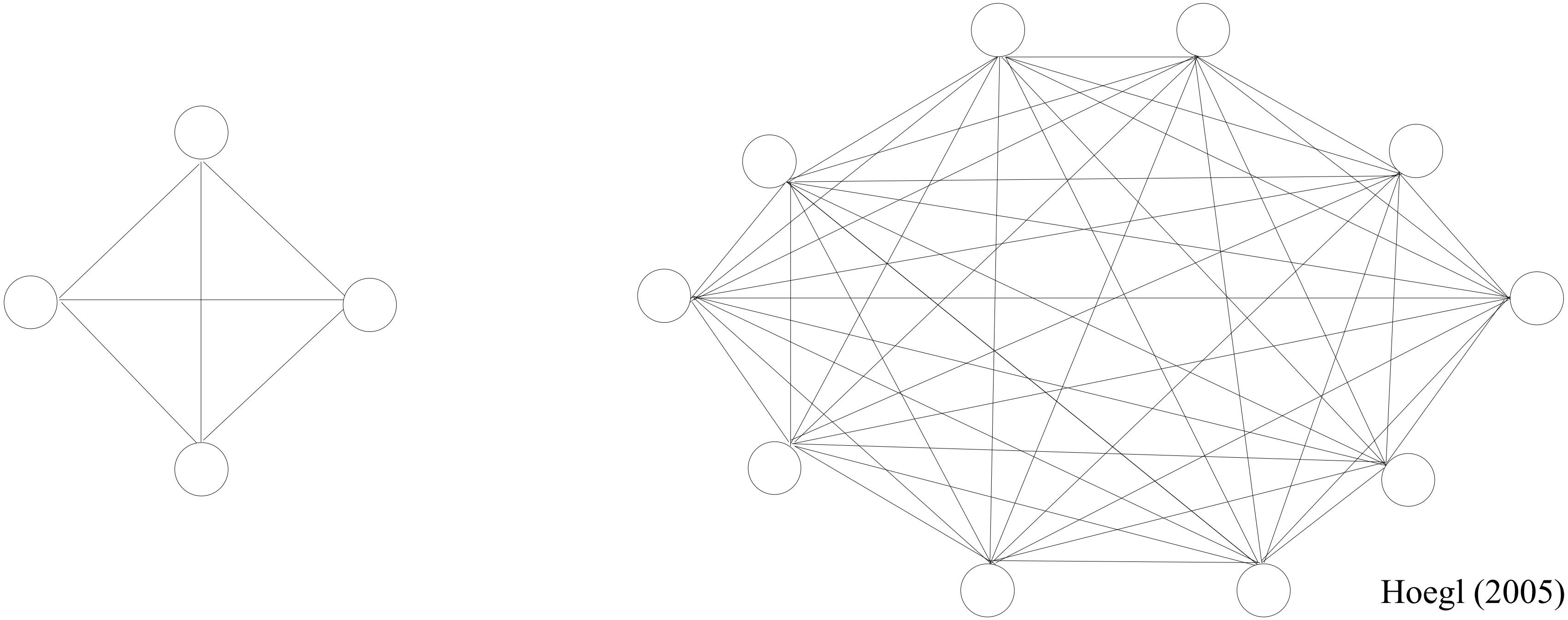
- Groupthink:
  - Fear to oppose majority / mainstream may cause withdrawal from active contribution.
- Memory blocking:
  - Other’s ideas may result in blocking own ideas (tip-of-the tongue state).
- Personality (Furnham & Yazdanpanahi,1995; Jung et al., 2012):
  - In group settings extraverts tend to contribute more to innovative team tasks than introverts do.
  - Extravert (dominant) individuals influence and exhibit an disproportionally high impact upon outcomes.

Teams & Innovation

- CONTRA: Teams are NOT a natural vehicle for creativity.
  - Creativity builds on divergent thinking (Runco, 2004):
    - Requires flexible thinking in different directions.
  - BUT: Team collaborative processes produce convergent forces:
    - Groupthink (Janis, 1995).
    - Constraining influence of others' ideas (Smith, 2003).
  - Productivity losses in groups:
    - Social loafing (Karau & Williams, 1993; Murphy et al., 2003).
    - Production blocking (Diehl & Stroebe, 1991; Nijstad & Stroebe, 2006).
    - Coordination losses (Hoegl, 2005).

Coordination Losses

- Increasing complexity and cognitive interference



Hoegl (2005)

Teams & Innovation

- 6 key indicators of high quality teamwork (Hoegl & Gemuenden, 2001):
  - Communication
    - Is there direct and open communication?
  - Coordination
    - Are individual efforts well structured and synchronized?
  - Balance of Member Contributions
    - Are all team members able to fully leverage their expertise?
  - Mutual Support
    - Do team members help and support each other?
  - Effort
    - Do team members exert all efforts on the team’s tasks?
  - Cohesion
    - Are team members motivated to maintain the team?

When to Use Teams?

- Even with high teamwork quality, some tasks are better carried out by individuals.
- High performance teams adjust their teamwork approach:
  - Need for teamwork is a matter of degree.
  - Need for teamwork changes over the duration of a project (as task uncertainty changes).
- Creative processes regularly need both individual elements and team elements (Paulus et al., 2010):
  - Individual preparation (coming up with many diverse ideas) and
  - collective discussion, elaboration, and selection of ideas.

Teams & Innovation: Takeaways

- Most innovative tasks are organized in teams.
- Work in teams is fundamentally different from individual work:
  - Team processes.
  - Consequences for work on innovative tasks.
- There are important advantages, but also important drawbacks when organizing innovative tasks in teams.
- Indicators of requirements for minimizing negative aspects of teamwork:
  - Teamwork quality (6 facets).
- Teamwork is not always a good thing for innovative tasks.

References

De Dreu, C. K. W. 2006. When too little or too much hurts: Evidence for a curvilinear relationship between conflict and innovation in teams. ***Journal of Management**, 32*(1), 83-108.

De Dreu, C. K. W., & Weingart, L. R. 2003. Task versus relationship conflict, team performance, and team member satisfaction: A meta-analysis. ***Journal of Applied Psychology**, 88*(4), 741-749.

De Wit, F. R. C., Greer, L. L., & Jehn, K. A. 2012. The paradox of intragroup conflict: A meta-analysis. ***Journal of Applied Psychology**, 97*(2), 360-390.

Diehl, M., & Stroebe, W. 1991. Productivity loss in idea-generating groups: Tracking down the blocking effect. ***Journal of Personality and Social Psychology**, 61*(3), 392-403.

Dugosh, K. L., Paulus, P. B., Roland, E. J., & Yang, H. C. 2000. Cognitive stimulation in brainstorming. ***Journal of Personality and Social Psychology**, 79*(5), 722-735.

Earl, M. 2001. Knowledge management strategies: Toward a taxonomy. ***Journal of Management Information Systems**, 18*(1), 215-233.

Edmondson, A. C., & Nembhard, I. M. 2009. Product development and learning in project teams: The challenges are the benefits. ***Journal of Product Innovation Management**, 26*(2), 123.

Hecht, H., & Proffitt, D. R. 1995. The price of expertise: Effects of experience on the water-level task. ***Psychological Science**, 6*(2), 90-95.

Hoegl, M. 2005. Smaller teams—better teamwork: How to keep project teams small. ***Business Horizons**, 48*(3), 209-214.

Hoegl, M., & Gemuenden, H. G. 2001. Teamwork quality and the success of innovative projects: A theoretical concept and empirical evidence. ***Organization Science**, 12*(4), 435.

References *(cont.)*

Homans, G. C. 1974. ***Social behavior: Its elementary forms***. New York, NY, U.S.: Harcourt, Brace, Jovanovich.

Janis, I. L. 1982. ***Groupthink: Psychological studies of policy decisions and fiascoes*** (2nd ed.). Boston, MA, U.S.: Houghton Mifflin.

Janis, I. L. 1995. Groupthink. In Staw, B. M. (Ed.), ***Psychological dimensions of organizational behavior*** (2nd ed., pp. 391-399). Englewood Cliffs, NJ, U.S.: Prentice Hall.

Jansson, D. G., & Smith, S. M. 1991. Design fixation. ***Design Studies****, 12*(1), 3-11.

Jones, B. F., Wuchty, S., & Uzzi, B. 2008. Multi-university research teams: Shifting impact, geography, and stratification in science. ***Science****, 322*(5905), 1259-1262.

Karau, S. J., & Williams, K. D. 1993. Social loafing: A meta-analytic review and theoretical integration. ***Journal of Personality and Social Psychology****, 65*(4), 681-706.

Luchins, A. S., & Luchins, E. H. 1972. ***Wertheimer's seminars revisited: Problems in perception***. Albany, NY, U.S.: State University of New York Press.

McDonough, E. F. I. 2000. An investigation of factors contributing to the success of cross-functional teams. ***Journal of Product Innovation Management****, 17*(3), 221-235.

Murphy, S. M., Wayne, S. J., Liden, R. C., & Erdogan, B. 2003. Understanding social loafing: The role of justice perceptions and exchange relationships. ***Human Relations****, 56*(1), 61-84.

Nemeth, C. J. 1997. Managing innovation: When less is more. ***California Management Review****, 40*(1), 59-74.

References *(cont.)*

Nijstad, B. A., & Stroebe, W. 2006. How the group affects the mind: A cognitive model of idea generation in groups. ***Personality & Social Psychology Review***, *10*(3), 186-213.

Nonaka, I. 1994. A dynamic theory of organizational knowledge creation. ***Organization Science***, *5*(1), 14.

Nonaka, I., & Takeuchi, H. 1995. ***The knowledge creating company: How japanese companies create the dynamics of innovation***. Oxford, U.K.: Oxford University Press.

Paulus, P. B. 2000. Groups, teams, and creativity: The creative potential of idea-generating groups. ***Applied Psychology: An International Review***, *49*(2), 237.

Paulus, P. B., Levine, D. S., Brown, V., Minai, A. A., & Doboli, S. 2010. Modeling ideational creativity in groups: Connecting cognitive, neural, and computational approaches. ***Small Group Research***, *41*(6), 688-724.

Polanyi, M. 1966. ***The tacit dimension***. London, U.K.: Routledge & Kegan Paul.

Runco, M. A. 2004. Creativity. ***Annual Review of Psychology***, *55*(1), 657-687.

Siebdrat, F., Hoegl, M., & Ernst, H. 2009. How to manage virtual teams. ***MIT Sloan Management Review***, *50*(4), 63-68.

Smith, S. M. 2003. The constraining effects of initial ideas. In Paulus, P. B. & Nijstad, B. A. (Eds.), ***Group creativity*** (pp. 18-31). Oxford, U.K.: Oxford University Press.

Smith, S. M., & Tindell, D. R. 1997. Memory blocks in word fragment completion caused by involuntary retrieval of orthographically related primes. ***Journal of Experimental Psychology: Learning Memory and Cognition***, *23*(2), 355-370.

References *(cont.)*

Smith, S. M., Ward, T. B., & Schumacher, J. S. 1993. Constraining effects of examples in a creative generation task. ***Memory & Cognition****, 21*(6), 837.

Ward, T. B. 1994. Structured imagination: The role of category structure in exemplar generation. ***Cognitive Psychology****, 27*(1), 1.

Wiley, J. 1998. Expertise as mental set: The effects of domain knowledge in creative problem solving. ***Memory & Cognition****, 26*(4), 716.

Wuchty, S., Jones, B. F., & Uzzi, B. 2007. The increasing dominance of teams in production of knowledge. ***Science****, 316*(5827), 1036-1039.

Prof. Dr. Stefan Razinskas
School of Business and Economics | Department of Management

Freie Universität Berlin

The Human Side of Innovation Projects

Session 7:

Innovation in teams – Team composition

No copying, photographing, video recording allowed.

© Prof. Dr. Stefan Razinskas. School of Business and Economics | Department of Management | FU Berlin. All rights reserved.

The recording and duplication of a course or its contents, e.g., slides or presentations, are prohibited for copyright and data protection reasons. Courses and contents thereof may not be distributed in whole or in part without authorization, especially not on the internet or in social networks. Insofar as personal data is processed, the relevant data protection regulations must be observed. The courses and contents are intended exclusively for educational purposes. Violations of any kind, in particular unauthorized recording of courses or contents, unauthorized use or distribution of courses or contents, violations of personal rights, illegal and improper data processing, manipulation of courses or contents, or disclosure of user IDs or passwords, will be prosecuted and punished.

To order copies or request permission to reproduce materials, e-mail stefan.razinskas@fu-berlin.de.

Recap: Teams & Innovation

- Most innovative tasks are organized in teams.
- Work in teams is fundamentally different from individual work:
  - Team processes.
  - Consequences for work on innovative tasks.
- There are important advantages, but also important drawbacks when organizing innovative tasks in teams.
  - Stimulation vs. blocking.
  - Efficiency gains vs. production blocking and coordination losses.
- Main goal of managing innovation on the team level: Leveraging advantages while minimizing disadvantages.

Team Composition

- Team composition: Attributes of a team’s members and the combination of such attributes (Ancona & Caldwell, 1992).
- We will have a look at two major aspects of team composition:
  - Team size
  - Team diversity
- Has been consistently shown to substantially influence team processes, emergent states, teamwork quality, and ultimately outcomes (Mathieu et al., 2008).

Team Size

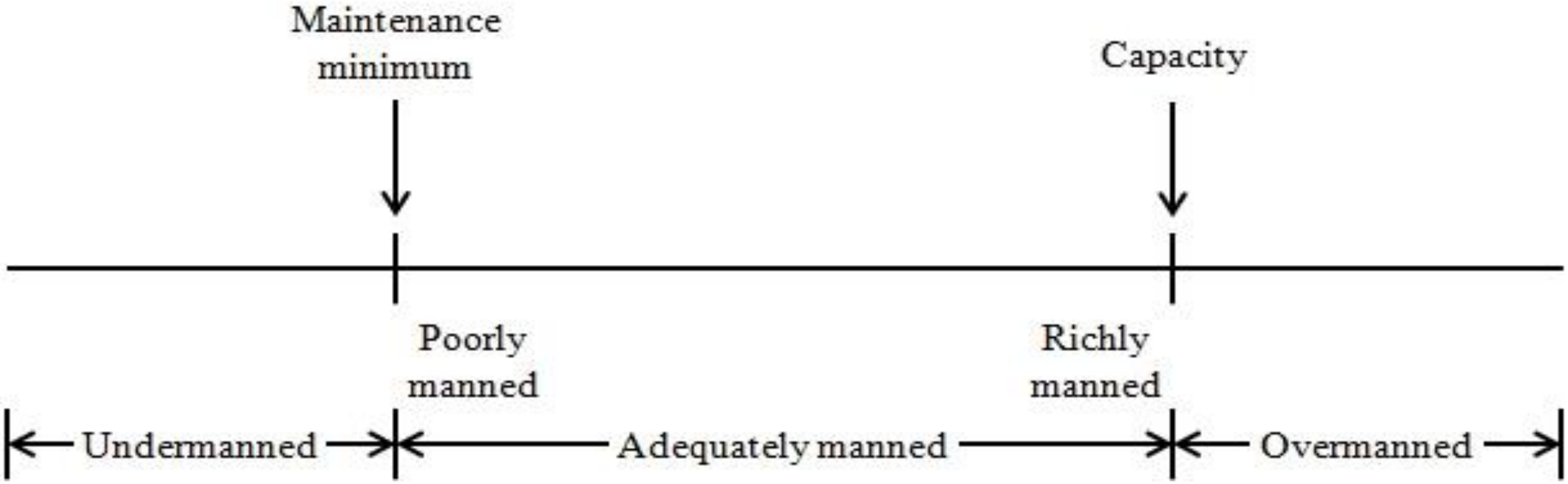
- Absolute team size: The number of team members assigned to a team.
- The smaller the team, the better the teamwork!
- Reasons for teams with innovative tasks getting bigger:
  - Political reasons; departments want to be represented.
  - Team leader wants headcount, just to be safe.
  - Leader does not want to appear exclusionary.
  - Certain tasks require a larger number of team members; elevated amount or heterogeneity of work to be done.
  - Potential benefits for innovative tasks; larger teams provide a wider array of diverse viewpoints, skills, and perspectives.

Team Size

- Ways to keep teams small (Hoegl, 2005):
  - Create a multi-team project: Larger tasks should be assigned to several small teams, rather than a single large one.
  - Core team versus extended team: Include only those individuals in the core team that are absolutely necessary for task completion.
  - Define team-external contributions: Specific tasks can be identified for team-external individuals or groups to provide, rather than including them within the team itself.
  - Project-phase specific team members: Keep team members on board during the phases for which they are needed, rather than carrying them throughout the whole project.

Team Size

- Relative team size: The number of team members in relation to the task at hand.
- Continuum of relative team size (Wicker, 1973):



Team Size

- Smaller, less adequate relative team sizes are likely to…
  - … increase individual motivation and effort (Ganster & Dwyer, 1995; Mechtel et al, 2011).
  - … increase perceived ownership and involvement (Perkins, 1982).
  - … increase perceptions of task identity and job enrichment (Vecchio & Sussman, 1981).
  - … increase team member skill utilization (Ganster & Dwyer, 1995; Hackman & Oldham, 1975).

Team Size

- BUT, smaller relative team sizes are also likely to…
- … result in a higher risk propensity of people (Balkundi et al., 2007):
  - Teams may perceive taking increased risks as the only possibility to accomplish the tasks at hand.
- … cause problems like concentration of information traffic, bottlenecks, and slowdown of information flows (Burt, 1992):
  - Team members lack the time for maintaining necessary communication.
- … decrease efficiency and effectiveness of the team (Hollenbeck et al., 2011):
  - Team members have to carry out more diverse tasks for which they lack proficiency to keep the project running.
- Differential effects on innovation outcomes (Weiss & Hoegl, 2016).

Team Diversity

- Team diversity: The degree to which there are objective or subjective differences among team members (van Knippenberg & Schippers, 2007).
- Two main categories of team diversity (van Dijk et al, 2012):
  - Demographic (or non-task related) diversity.
    - Age, nationality, gender, language…
  - Functional (or task-related) diversity.
    - Educational and professional background, job experience…

Team Diversity

- What are the advantages of using diverse teams for innovative tasks?
- Diversity as an informational resource:
  - Demographic and functional differences among team members are associated with differences in knowledge and experiences (Tsui & O'Reilly, 1989).
  - As a consequence, more diverse groups can draw from a larger pool of task-relevant information (van Dijk et al., 2011; Hülsheger et al., 2009).

➡ More diverse groups should be able to outperform groups that are less diverse.

Team Diversity

- BUT: The use of more diverse teams comes with a cost (Van Knippenberg et al, 2004).
- Social categorization theories (e.g., Tajfel & Turner, 1986) suggest that less diverse teams enjoy an advantage in teamwork:
  - Team members tend to distinguish between others similar to themselves and others who are different from themselves.
  - Such distinctions can engender intergroup biases (van Knippenberg & Hogg, 2003).
- Problem more likely to occur the more salient the distinguishing attribute is.
  - Apparent aspects (e.g., gender, language) vs. non-apparent aspects (e.g., educational or professional background).
  - Distribution of distinguishing attribute within the group.

Team Diversity

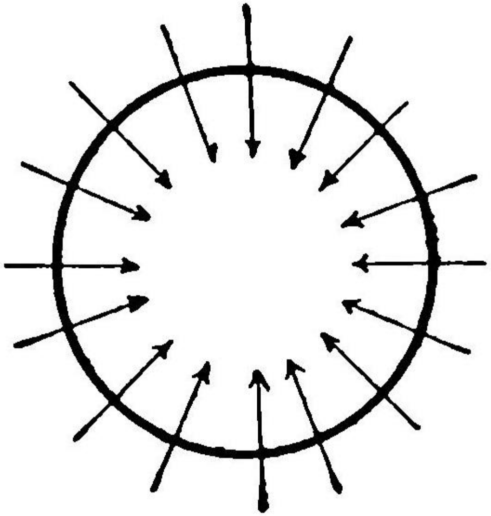
- The problematic role of team faultlines.
- Faultlines: Hypothetical dividing lines that may split a group into subgroups based on one or more attributes (Lau & Murnighan, 1998).
  - May occur when team members vary on certain attributes (e.g., gender, nationality)…
  - … and when certain features of the team task or context make such differences salient (Lau & Murnighan, 2005; Li & Hambrick, 2005)…
  - … or under stressful conditions like time pressure (Kearney, 2013).
  - Then these diversity dimensions yield a basis for subgroup differentiation within a team.
- Active team faultlines inhibit smooth and harmonious team processes.

Team Diversity

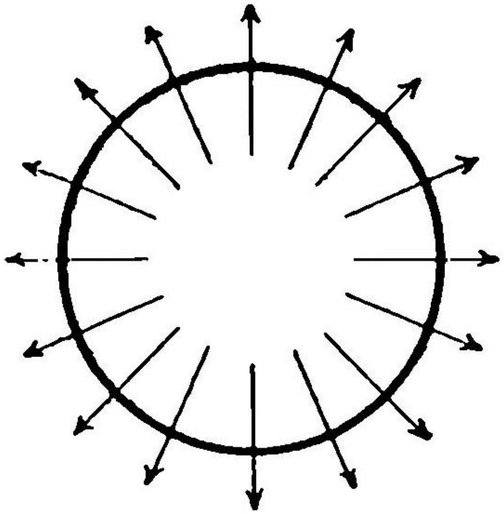
- Recommendations to bridge team faultlines:
  - Diagnosing dormant or active faultlines in teams (Rico et al., 2011) and avoiding activation (Jehn & Bezrukova, 2010).
  - Increasing the identification of team members with their team rather than their subgroup (e.g., Pratt et al., 2000).
  - Establishing conflict norms, as negative effects are mediated by the level of emotional conflict within teams (Pearsall et al., 2008).
  - Creating reward structures on the basis of team goals accomplishment (Li & Hambrick, 2005).
  - Adequate formation of subgroups when splitting up tasks (Rico et al., 2011).

Team Diversity

- Centrifugal vs. centripetal forces in teams with innovative tasks (Atuahene-Gima, 2003; Sheremata, 2000):
  - Centrifugal forces: Structural elements that increase available knowledge and information. They pull a team outward, away from its conceptual center.
  - Centripetal forces: Structural elements that integrate dispersed knowledge and information into collective action. They pull a team inward, toward its conceptual center.



centripetal



centrifugal

Team Diversity

- Consequences for teams with innovative tasks:
  - Centrifugal forces are about generating different ideas, perspectives, and opinions.
  - Centripetal forces are about integrating and implementing ideas and deciding on what course of action to pursue.
- Imbalance of these forces impedes performance (Kearney et al., 2009).
  - Centrifugal forces (like team diversity) benefit performance to the extent that they are complemented by centripetal forces and vice versa.
  - Each force enables the positive and prevents the negative of the respective opposite, but complementary force.

Team Diversity

- Management has to exert additional centripetal force to overcome the negative effects of centrifugal forces (Sheremata, 2000).
  - Leadership approaches to strengthen knowledge and information integration in teams:
    - Transformational leadership (Kearney & Gebert, 2009).
    - Task oriented leadership (Klein et al., 2011).
    - Temporal leadership (Mohammed & Nadkarni, 2011).
  - Collectivistic culture, superordinate identity.
  - (Temporal) increase of task structure (Sheremata, 2000).

Team Diversity

- Team diversity acts as a stressor in teams with innovative tasks (Razinskas et al., 2013).
  - Individuals have limited capacity for self-regulation (Muraven et al., 1998).
  - Interacting with more diverse team members affords more regulatory capacity than interactions in a homogeneous team.
  - When further stressors are added (e.g., time pressure, lack of resources), even more regulatory capacity is needed.
  - ➡ Potential regulatory depletion tends to impede team effectiveness in such situations.
- Deciding on team composition depends not only on task type, but also on the level of stress a team is expectedly exposed to.
  - Under stressful conditions it appears beneficial to reduce diversity of team members (Kearney, 2013; Razinskas et al., 2013).

Team Composition: Takeaways

- Team composition exerts a considerable influence on teamwork quality and outcomes of teams with innovative tasks.
- Team size is distinguished in absolute and relative team size.
    - Preferable to keep absolute headcounts small.
    - Differential effects of relative team size on teams with innovative tasks.
- Team diversity can be distinguished in demographic and functional diversity.
    - Double-edged sword of diversity; increasing knowledge resources but impeding teamwork quality.
    - Importance of recognizing faultlines in teams and avoiding their activation.

References

Ancona, D. G., & Caldwell, D. F. 1992. Demography and design: Predictors of new product team performance. ***Organization Science**, 3*(3), 321-341.

Atuahene-Gima, K. 2003. The effects of centrifugal and centripetal forces on product development speed and quality: How does problem solving matter? ***Academy of Management Journal**, 46*(3), 359-373.

Balkundi, P., Kilduff, M., Barsness, Z. I., & Michael, J. H. 2007. Demographic antecedents and performance consequences of structural holes in work teams. ***Journal of Organizational Behavior**, 28*(2), 241-260.

Burt, R. 1992. ***Structural holes: The social structure of competition**.* Cambridge, MA, U.S.: Harvard University Press.

Ganster, D. C., & Dwyer, D. J. 1995. The effects of understaffing on individual and group performance in professional and trade occupations. ***Journal of Management**, 21*(2), 175.

Hackman, J. R., & Oldham, G. R. 1976. Motivation through the design of work: Test of a theory. ***Organizational Behavior and Human Performance**, 16*(2), 250-279.

Hoegl, M. 2005. Smaller teams—better teamwork: How to keep project teams small. ***Business Horizons**, 48*(3), 209-214.

Hoegl, M., & Gemuenden, H. G. 2001. Teamwork quality and the success of innovative projects: A theoretical concept and empirical evidence. ***Organization Science**, 12*(4), 435.

Hollenbeck, J. R., Ellis, A. P. J., Humphrey, S. E., Garza, A. S., & Ilgen, D. R. 2011. Asymmetry in structural adaptation: The differential impact of centralizing versus decentralizing team decision-making structures. ***Organizational Behavior & Human Decision Processes**, 114*(1), 64-74.

References *(cont.)*

Hülsheger, U. R., Anderson, N., & Salgado, J. F. 2009. Team-level predictors of innovation at work: A comprehensive meta-analysis spanning three decades of research. ***Journal of Applied Psychology***, *94*(5), 1128-1145.

Jehn, K. A., & Bezrukova, K. 2010. The faultline activation process and the effects of activated faultlines on coalition formation, conflict, and group outcomes. ***Organizational Behavior and Human Decision Processes***, *112*(1), 24-42.

Kearney, E. 2013. Does time pressure make diverse teams derail? Joint effects of demographic diversity and time pressure on team performance. Paper presented at the ***2013 Annual Meeting of the Academy of Management***, Orlando, FL, U.S.

Kearney, E., & Gebert, D. 2009. Managing diversity and enhancing team outcomes: The promise of transformational leadership. ***Journal of Applied Psychology***, *94*(1), 77-89.

Kearney, E., Gebert, D., & Voelpel, S. C. 2009. When and how diversity benefits teams: The importance of team members' need for cognition. ***Academy of Management Journal***, *52*(3), 581-598.

Klein, K. J., Knight, A. P., Ziegert, J. C., Lim, B. C., & Saltz, J. L. 2011. When team members' values differ: The moderating role of team leadership. ***Organizational Behavior and Human Decision Processes***, *114*(1), 25-36.

Lau, D. C., & Murnighan, J. K. 1998. Demographic diversity and faultlines: The compositional dynamics of organizational groups. ***Academy of Management Review***, *23*(2), 325-340.

Li, J., & Hambrick, D. C. 2005. Factional groups: A new vantage on demographic faultlines, conflict, and disintegration in work teams. ***Academy of Management Journal***, *48*(5), 794.

References *(cont.)*

Mathieu, J., Maynard, M. T., Rapp, T., & Gilson, L. 2008. Team effectiveness 1997-2007: A review of recent advancements and a glimpse into the future. ***Journal of Management***, 34(3), 410-476.

Mechtel, M., Bäker, A., Brändle, T., & Vetter, K. 2011. Red cards: Not such bad news for penalized guest teams. ***Journal of Sports Economics***, *12*(6), 621-646.

Mohammed, S., & Nadkarni, S. 2011. Temporal diversity and team performance: The moderating role of team temporal leadership. ***Academy of Management Journal***, *54*(3), 489-508.

Muraven, M., Tice, D. M., & Baumeister, R. F. 1998. Self-control as limited resource: Regulatory depletion patterns. ***Journal of Personality & Social Psychology***, *74*(3), 774-789.

Pearsall, M. J., Ellis, A. P. J., & Evans, J. M. 2008. Unlocking the effects of gender faultlines on team creativity: Is activation the key? ***Journal of Applied Psychology***, *93*(1), 225-234.

Perkins, D. V. 1982. Individual differences and task structure in the performance of a behavior setting: An experimental evaluation of barker's manning theory. ***American Journal of Community Psychology***, *10*(6), 617-634.

Pratt, M. G., Fuller, M. A., & Northcraft, G. B. 2000. Media selection and identification in distributed groups the potential costs of "rich" media. ***Research on Managing Groups and Teams***, 3, 231-255.

Razinskas, S., Weiss, M., & Hoegl, M. 2013. The interplay of stressors and cross-functionality in innovation project teams: A cross-level study. Paper presented at the ***2013 Western Academy of Management Conference***, Santa Fe, NM, U.S.

Rico, R., Sánchez-Manzanares, M., Antino, M., & Lau, D. 2011. Bridging team faultlines by combining task role assignment and goal structure strategies. ***Journal of Applied Psychology*** *97*(2), 407-420.

References *(cont.)*

Sheremata, W. A. 2000. Centrifugal and centripetal forces in radical new product development under time pressure. ***Academy of Management Review**, 25*(2), 389-408.

Tajfel, H., & Turner, J. 1986. ***The social identity theory of intergroup behaviour***. Chicago, IL, U.S.: Nelson Hall.

Tsui, A. S., & O'Reilly, C. A. 1989. Beyond simple demographic effects: The importance of relational demography in superior-subordinate dyads. ***Academy of Management Journal**, 32*(2), 402-423.

Van Dijk, H., van Engen, M. L., & van Knippenberg, D. 2012. Defying conventional wisdom: A meta-analytical examination of the differences between demographic and job-related diversity relationships with performance. ***Organizational Behavior and Human Decision Processes**, 119*(1), 38-53.

Van Dijk, S., Berends, H., Jelinek, M., Romme, A. G. L., & Weggeman, M. 2011. Micro-institutional affordances and strategies of radical innovation. ***Organization Studies**, 32*(11), 1485-1513.

Van Knippenberg, D., De Dreu, C. K. W., & Homan, A. C. 2004. Work group diversity and group performance: An integrative model and research agenda. ***Journal of Applied Psychology**, 89*(6), 1008-1022.

Van Knippenberg, D., & Hogg, M. A. 2003. A social identity model of leadership effectiveness in organizations. ***Research in Organizational Behavior**, 25*, 243-295.

Van Knippenberg, D., & Schippers, M. C. 2007. Work group diversity. ***Annual Review of Psychology**, 58*, 515-541.

Vecchio, R. P., & Sussmann, M. 1981. Staffing sufficiency and job enrichment: Support for an optimal level theory. ***Journal of Occupational Behavior**, 2*(3), 177-187.

References *(cont.)*

Weiss, M., & Hoegl, M. 2016. Effects of relative team size on teams with innovative tasks: An understaffing theory perspective. ***Organizational Psychology Review****, 6*(4), 324-351.

Wicker, A. W. 1973. Undermanning theory and research: Implications for the study of psychological and behavioral effects of excess human populations. ***Representative Research in Social Psychology****, 4*, 185-206.